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VILLA GARDENING

A HANDBOOK

FOR

AMATEUR AND PRACTICAL GARDENERS

BY

EDWARD HOBDAV

AUTHOR OF 'COTTAGE GARDENING'

London

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PREFACE

THE Articles in the following pages, with alterations and additions, have been reprinted from *Gardening* by the kind permission of Mr. WILLIAM ROBINSON, in the hope that they may be useful to that very large middle-class who are owners or occupiers of gardens from one to eight or ten acres in extent, and among whom are found some of the warmest supporters of Horticulture and Horticultural Literature. I am prepared to hear from my critics that the book has defects; but the object I have kept steadily in view has been to make it as plain and practical as possible. If I have succeeded in this, I hope its faults, from a literary point of view, may be judged leniently. I confess, too, I have been animated by a lingering kind of hope that the book may be useful to some among the numerous body of young gardeners springing up all over the country, and for whom I feel the very greatest sympathy.

E. H.

21st February 1887.

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ERRATUM.

On p. 20, last line, *for* "reeper" *read* "Creeper."

VILLA GARDENING

PART I

CHAPTER I

Selecting the Site.—It is possible to make the poorest soil fertile, but it is a long, expensive operation; and in selecting the site for a villa residence, if one is fond of gardening, some consideration should be given to the character of the soil, for on a good soil the gardening operations may not only be more extended in character, but they also will give more satisfaction. In fact, if we garden on very bad land we shall be shut out from the higher flights of open-air gardening, which, after all, is the most enjoyable. We may quote Cowper, and say, "Who loves a garden loves a greenhouse too," with perfect truth; but gardening in the open air is the healthiest and pleasantest, as well as the least expensive, and much more may be done with trees, shrubs, and hardy plants generally than has yet been attempted in most gardens.

Three main requisites to successful gardening are a good deep soil, shelter from biting winds, and an atmosphere free from impurities, or at least nearly so. And happy is the man who can secure a combination of these three on the same site. Too often if we obtain good soil we are blown to pieces by the winds, and nearly always in the neighbourhood of large towns the atmospheric question is a serious one, and puts a limit to the number of plants that can be grown with success; and I hold it to be the merest folly to attempt to grow a plant that experience has shown cannot do more than pass a lingering existence in that particular situation. In all gardening there is yet something to learn as regards the right things to plant in one given situation, and this matter perhaps will not be altogether put right until those most directly interested take it up and work it out for themselves. Rule-of-thumb men, deeply

steeped in preconceived notions, seldom get out of the deep groove they and their fathers have made for themselves. If the track is to be broken up and a new departure made, the chief impetus must come from without. Though good soil is essential in all-round gardening, yet there is no soil so bad but something may be made to thrive in it, and no atmosphere so murky but some living plant will adapt itself to it; and success in gardening is often a question of adapting means to ends, and finding out what we can and what we cannot do. Though the experience of others will be a great help to us, yet so varied are the conditions under which we work that in the main each one for himself has to work out his own position, and find that eternal fitness of things for which all men are striving, but which is sometimes so difficult to explain or point out.

Next in importance to the soil being of fair gardening quality (a light loam being the best for most things and clay the worst), comes the question of shelter from winds. The motion of the atmosphere, when not too violent, is beneficial to most things; but where the currents are fierce and frequent, the list of plants that are capable of resisting their force is limited. Still, though limited in number, if made use of in the right way, shelters can quickly be created, and here again comes in the question of adapting means to ends, as the sheltering beds or groups that would suit one position would not fit in everywhere. A very exposed position on the top of a hill might require elaborate preparations, but I have never seen a position that might not be sheltered from cold cutting winds if set about in the right way. In situations where it is important that shelter should be quickly raised, a mound might be thrown up on the windward side and planted with wind-resisting plants. On the outer margin might be planted a thick verge of the common Gorse. The margin need not be of the same width throughout, but it should possess a sufficient depth to arrest and lift up the swift currents of air, robbing it at the same time of its icy coldness. Inside the Gorse might come a belt of Austrian Pine, among which may be thinly planted the Huntingdon Elm. The Gorse and the Pines alone might suffice in some cases, and in others the Elms would be sufficient; the latter bear pruning well, are tough and elastic, and not easily splintered by the wind. There are other trees which may be employed for this purpose—the Wych Elm, the Lime, and the Ash-leaved Maple all bear pruning until a dense habit capable of offering a great resistance to the wind is created. There are many ways of sheltering ourselves and our dwellings from rough winds, but there is nothing

equal to a long wall of tree or shrub growth. A stout, thick Thorn hedge is better than a brick or stone wall for sheltering tender plants from cutting winds. The hedge or belt of trees being open and elastic, the wind becomes entangled, and its force broken and scattered; whilst the swift current simply rebounds from the harsh, stubborn, unyielding surface of the wall, and starts again with a fresh impetus added to its force.

Thoughts on Garden Design.—The uppermost impression on my mind is that villa gardens are needlessly expensive in design, and that the cost of after keeping is increased by over-elaboration at the outset. This must be taken of course as a general statement. There are exceptions, which are usually the reflections of superior individual minds brought to bear upon their gardens. There are villas and villas, but the vicarage garden comes nearest to my idea of what an average villa garden should be for real comfort and happiness. The evidences of refined thought which commonly abound in the average rectory garden, the free use that is made of trees and shrubs, the freedom of treatment which is the natural outcome of much thought unfettered by preconceived notions, produces a pleasing whole. The gardens of the present day are most of them too stiff, too formal, to give pleasure to the calm thinking man who goes to nature for his models. But the average man is an imitator; it saves trouble to do as others are doing rather than think out a course for ourselves. Hence it follows that there is such a dearth of originality. Where, in laying out a garden, the tendency is towards extravagance, the result is seldom commensurate with the outlay. Extravagance never gives pleasure for any length of time; the idea is sure to crop up in the mind when the novelty has worn off—is the game worth the candle? And the answer is nearly always in the negative. The pleasantest gardens are those which present a series of pretty pictures separate and distinct, and yet blending harmoniously, and the garden must be very small which does not permit of this being done. It is delightful to have a lawn of closely-shaven turf running up to the windows, falling away and losing itself in vistas and glades through shrubs and the branches of trees. And it is pleasant to penetrate these openings in the shrubs and trees, and discover the rockery, the fernery, and other phases of culture which a garden of only very moderate extent may possess.

Of late years too much use has been made of bright-flowered exotics. Every bit of level ground has been laid out in geometrical figures, and every mound or bit of rising ground has been scarped into terraces with their accompanying architectural features, which

has spoiled many a country residence by destroying its repose. The simplest designed garden is generally the most pleasing. Trees and shrubs in variety are always pleasant features, and so much can be made of them by a thoughtful, skilful designer. The great evil of amateur work in garden designing is from the want of knowledge of the materials employed; trees and shrubs are often wrongly placed. But still, with all the drawbacks arising from this and other causes, I think the owners of gardens might with advantage make their influence more felt. To do this of course with effect, they must take more interest in their gardens—must become acquainted with the plants and their wants. And no matter in how small or simple a manner we may begin, when we have wrought among and studied the materials, more or less effective combinations will grow out of it, in the same way as a tiny plant may grow into a large spreading mass, assuming fresh forms and outlines with every change of season. It is a common thing for a person to take up a thing—gardening, for instance—somewhat languidly, and before much progress is made something occurs that arouses fresh interest in the matter in hand; the lethargy—the feeling of *ennui*—wears off, and we view not only this one particular thing, but all others, in a different light. Now, this is the feeling I am anxious to inspire; but it is never wise to begin too lavishly at first, for lavish expenditure when applied to gardening, unless the means are unlimited, very often when the inevitable reaction sets in gives rise to feelings akin to disgust.

Flowers there must and may be at all seasons in even the smallest gardens. Well-cared-for cottage gardens even are rarely altogether flowerless, unless sealed up with frost in winter. It is pleasant to see a roomy old-fashioned house embowered in trees, with pleasant patches of green undulated turf beneath the windows, not dotted over with flower-beds, as was till lately too much the fashion, but free and open for the children to romp and play on. Here and there trees and shrubs and groups of flowers may grow out of it, but not in formal masses, and its boundaries should be as free and informal as are the tangled creepers growing up the walls and over the verandah of the house itself. There should, of course, be order and method even in a garden like this. The swaying branch of the creeper must have a limit assigned to it, or the wall may be stripped of its covering. All the difference between the natural and the severely formal is—in the one case every shoot and leaf must fill its special place, and in the other only security from wind is sought. Beyond all is free, and the grace, motion, and life which this freedom gives is pleasant to witness. But this is only one phase of gardening, and all men's minds are

not framed alike any more than their faces, and there is room for working out every shade and variety of opinion. And the more thought there is brought to bear upon any business the better. As regards formal or

Geometric Gardening, that eternal "fitness of things" to which I have already alluded will find and suggest many a place where it can be appropriately carried out. In small gardens, where the outlines are formal, there must of necessity be straight lines, and the geometrical pattern fits in so easily with a square house; but even in this case sharp points and corners should be avoided as much as possible, for they contribute neither grace nor beauty to the scene. A house or building of any kind without tree furniture has always a bare and barren look about it, and whoever adopts the geometric style of gardening must bear in mind that it is more expensive than where one can set out beds and borders by simply trailing a long rope behind as one walks round the place, and mark out the beds, borders, and walks by driving down stakes on the rope's sinuous course. It is the custom in building the villa to place it in the centre of the grounds, but when the place is limited in extent this is not always wise, as it cuts up the ground so much and contracts the gardener's efforts. A better plan would be to place the house farther back, or to select the site so as to give more scope for creating a deeper, more extensive view from the windows. There must of necessity be room behind for the offices, but if a good part of the ground is in front of the house, the surface could be so arranged as to give greater apparent extent without sacrificing either appearance or utility. There would thus be more privacy, and room might be found in front and on the flanks for fruit and vegetables if it was not thought desirable to give up so much space for merely ornamental purposes. Apples and Pears, Asparagus and Strawberries might be elevated in character, and perhaps better cultivated, by promotion to a more prominent position. In building a villa residence where the garden was thought worthy of being made a special feature, there may be circumstances under which it would be desirable not only to put back the house, but to alter its position from right to left, or wherever the best effects could be obtained, taking advantage of the formation of the ground. I have known villas so badly placed as to be cramped in front, whilst behind there was plenty of room.

I merely throw out this hint, not with the view of dictating to any one, but as a suggestion out of which something might perhaps grow. Intricate patterns that may attract attention on paper generally lose some of their beauty when laid down in the garden, and the difficulties of planting such patterns satisfactorily

are very considerable. Intricacy or embroidery always adds to the first cost, as well as to the annual expense of keeping. Perhaps this additional cost might be borne if it continued to give pleasure ; but this rarely happens, and I would strongly advise all who really love flowers, and want to enjoy them in their gardens in all stages of their growth, to have the outlines of the garden as simple and flowing as possible, that both the eye and the mind may love to dwell upon it ; and having done this, to care specially for the beds and borders that are to receive the living occupants of the garden.

Preparatory Work.—This will consist first of draining, which should be thoroughly done in order to lay the place dry and make it comfortable to work and walk on at all seasons. The details of this work can only be arranged on the spot, as heavy cold clays may require drains at frequent intervals, and where trees are to be planted the drains should be not less than $3\frac{1}{2}$ feet deep. Then after the draining is accomplished the roads and walks should be set out, and all the ground intended for shrubs or turf trenched not less than 20 inches deep, and before this work is done, or during its progress, any alteration of surface that may be desirable to improve the outline of the place should be carried out. A geometrical or formal garden will require flat surfaces, whilst the picturesque or the rustic, or what we may term the English garden, in contradistinction to the Italian or Dutch style, should have the surface undulated, sometimes rising into boldness of expression, at others sinking gradually away.

Wherever the ground rises into prominence the summits should be crowned with trees and shrubs, or perhaps a tree or two may be planted in the background with shrubs in front, those near the margin being of a drooping character of growth. In arranging an English garden special sites should be created for hardy plants and other features which it may be desirable to introduce. Alpines and Ferns are specially interesting subjects, and in laying out the place an eye could be had to a suitable site for them, although their day may be for a time deferred. There must, of course, be Roses, but I do not care about a formal garden for them. They may be planted anywhere and everywhere, and they will be referred to again hereafter, so I shall not dwell upon this part of my subject now.

What are called American shrubs, such as Rhododendrons and Azaleas, are so beautiful in spring that an effort should be made, if possible, to provide a place for some of them. In the majority of gardens some little extra preparation is required by the addition of manure, leaf-mould, sand, etc., to the soil ; and all such work can be done better before the place is laid out, or at least before the

finishing touches are given, than after. The site of the different features should be marked on a plan of the ground, but no one can give a plan that will be adapted to any given site without seeing the place and its surroundings. Useful ideas may sometimes be gleaned from plans in books, but, except in the case of geometrical figures and as illustrations of particular ideas, they are practically useless, and the man who undertakes to furnish a plan for a garden without having seen the site generally misses his mark. The advantages of thinking out the whole plan so as to grasp all the probable features as a whole are very great, especially in the economical arrangement of the work, and the beds for the different subjects should be prepared early to give time for settling.

Fences.—Brick walls are commonly employed as boundary fences to gardens, because of the sense of security which they impart; but as regards appearance they are always unsatisfactory until clothed and hidden by greenery of some kind. In some places long, straight boundary walls are exceedingly objectionable, and a long, straight, closely-cut hedge is almost as bad, unless its utility as a fence carries conviction to the mind of its necessity; and so mere usefulness carries the day. But there are many ways of breaking up the unsightliness of ugly dead walls. The Irish Ivy will soon hide a high wall, and a collection of various coloured Ivies will be an interesting feature always. Straight lines of wall or hedge can be broken up by a group of shrubs here and there placed judiciously for that purpose. Hollies make splendid fences where the soil suits them, but they will not grow with equal luxuriance everywhere; still with liberal treatment there are but few places where the Holly will not in a few years form an excellent fence, and once formed it will be a fixture. Where a fence and nothing but a fence is wanted, for general utility very few plants will beat the White Thorn. The site should be well prepared by trenching, and the plants put in 6 inches apart in a single row. The plants should be about the same strength, so that all may come away together, and then with care and the right shape insisted on, a splendid fence will be the result. A very great deal depends upon the shape in the case of a Thorn hedge. If the sides are cut straight up nothing can prevent the bottom branches dying off, and the hedge as a fence is soon spoiled, and has to be cut down; but if from the first the hedge is cut into a pyramidal or inverted Λ form every branch gets its fair share of light, air, and rain, and consequently all flourish alike. The Yew Tree, the Arborvitæ, the Spruce Fir, Box, Privet, Asiatic Barberry, and the common Laurel are all useful as hedge plants where evergreen hedges are required. And in the south of England, where

the climate is mild, the *Laurustinus* and the *Fuchsia* may be employed for ornamental fences and for screens; the *Clematis*, the *Rose*, and *Honeysuckle* may blend together charmingly on a rustic fence or be trained over a wire trellis.

For suburban gardens, ornamental iron fences are frequently employed, and where the garden or grounds are bounded by a public road, unless privacy requires it, there is no occasion to hide every part of it, as its evident necessity and purpose satisfies the mind.

Roads and Walks.—Where the grounds are extensive, the approach to the house often offers facilities for the display of the designer's skill and taste; but anything that is glaringly deceptive, though it may amuse for a time, will not satisfy. For instance, it is possible so to arrange groups of shrubs and trees as to lead the approach road from point to point, with the view of making a small place appear a large one, entirely ignoring the utility of the road as a means of reaching the house. But this principle, though excusable when applied to walks in pleasure grounds, should be very cautiously employed in works of mere usefulness. Garden paths may wind and meander about to take in objects of interest; but an approach road is first of all a work of utility, its necessity is self-evident, and though it may turn aside to take in a fine view or a charming prospect, yet the useful should not be sacrificed to it.

Roads should be well drained and made of durable materials, and not too wide or too conspicuous. Usually there are materials for road-making on or near every estate or district. The surface should be laid at such an angle that the water can drain freely off it, as nothing wears out a road so fast as pools and puddles of water standing about its surface. A long stretch of brown road, if in full view of the windows, is objectionable from its wearisome appearance; but a group of low trees just skirting the edge will break up the monotonous aspect, and it can be repeated if necessary. In some cases the road may be sunk beneath the ordinary ground level. I have adopted this plan sometimes to take a road through a fine bit of lawn without spoiling the view. Garden walks should be made well in the first instance. There is no work in which thoroughness will yield so good a return. When the garden walks are scamped, the trouble with weeds will be incessant, and the annoyance from damp paths in winter great. There should be a drain along the lowest point, and the foundation of the path should be composed of broken bricks, stones, clinkers, or something equally porous, and this material should be at least a foot thick on paths much used; and on this foundation

should be laid from 3 inches to 4 inches of good binding gravel. Such a path will last without much labour for a century if need be; but unless the walk is laid perfectly dry it will never be satisfactory, and well-made roads and walks about a place are a luxury which everybody appreciates in bad weather.

Very conspicuous garden paths may have their bareness of aspect toned down and made interesting by a Weeping Ash, which can be supplemented in the foreground by a group of low shrubs, such as Barberries or Rhododendrons, and in the distance a conifer of some free-growing kind, such as the Cedar of Lebanon or *Picea Nordmanniana*, might be introduced. These are merely suggestions based on what I have found useful in practice. Unnecessary walks or roads should never be tolerated, as a garden or grounds interlaced with brown stripes of gravel cannot please.

Asphalte, when properly laid down, makes firm, dry paths, but a gravel path seems to accord more with our idea of what a garden path should be; and in the country, where the materials for walk-making are always at hand, very few asphalte walks are made. Still, asphalte forms a very useful and durable path.

CHAPTER II

Planting Trees and Shrubs.—There is scarcely anything in gardening that calls for the exercise of taste, judgment, and knowledge in a greater degree than does the planting of trees. If well-placed, trees are a constantly increasing source of interest. Those who have not made trees a study have no idea of the beauty and grandeur of the scenes which may be created by them. It is true in a villa garden we cannot have the woods upon woods the poet speaks of, but exceedingly pretty pictures may be made in a limited space if the right materials are selected and judiciously placed. The collection of trees and shrubs at the planter's disposal are very extensive, without touching those whose hardiness is doubtful. Our own native trees are a host in themselves, and besides this, every country possessing a temperate climate has been ransacked by collectors for the express purpose of adding to our stock. To form screens, or to blind unsightly objects, the Red-twigged Lime, the Wych Elm, and the Ash-leaved Maple grow rapidly and submit readily to pruning. The Lombardy Poplar also grows rapidly, and may be planted where the space is too limited for a tree of spreading habit. Evergreen trees for a like purpose may be found among conifers, such as the Austrian Pine, the Lawson Cypress, and *Thuja Lobbiana*.

Among evergreen shrubs of lower growth but dense habit are the common Yew, the evergreen Oak, the common Laurel, and the green-leaved Holly. The screens or blinds can be made to serve as backgrounds for pleasant pictures of tree and shrub growth. Here, for instance, is a description of a very pretty garden scene, the first idea of which sprang up in a desire to hide an unsightly building. A group of Limes was planted first because of their rapid growth, and as they grew up the further idea of using them as a background occurred. A Purple Beech was planted opposite the centre of the group of Limes, but some 15 yards in advance. Right of the Beech was a Cedar of Lebanon, and a *Cedrus atlantica* was planted on the left hand; a like distance in front of the Beech was a group of five variegated Hollies, back a little on the flank of the Hollies was a Lawson Cypress on one side and *Cupressus macrocarpa* on the other. The Hollies formed a denser group, but the other trees stood thinly for the light to play in amongst them, and the grass grew up round their stems. Overcrowding I hold to be almost a crime. Let everything have a chance to show what it is capable of doing. The collections of shrubs and trees are now so extensive in the best nurseries, that any one who will take the trouble to become acquainted with them may form pretty pictures suitable for small as well as large places. Wherever there is space, the Plane and the Weeping silver-barked Birch are well adapted for central positions, around which may be grouped trees and shrubs remarkable for their beauty of leafage or striking habit of growth. The Weeping Lime and the Weeping Willow, with other trees of standard growth, are specially desirable for making effective pictures in certain positions.

Few gardens are so well planted as they might and ought to be, though how or why this is I need not stop to inquire; but during the rush after scarlet Geraniums and other ephemeral things of no particular value, the permanent things, "the joys for ever," have been neglected, and even in large places, where the shrubberies and grounds are extensive, too much space is occupied by the Laurel, the Larch, and common things generally, which are well enough in their place as nurses or as foils to other contrasting trees of graceful habit, such as the Birch for instance; but in no case should so much space be given up to them when so many better things are waiting to find a home in our plantations and pleasure grounds. I should like to see more character imparted to the shrubberies to make them less monotonous, for there ought not to be that perpetual sameness there so frequently is. A variegated Holly always imparts character as it gathers size, and some of the green Hollies are not much behind for effectiveness, notably

Hodginsi, which is a grand plant. Fruit-bearing trees, such as bright coloured Apples, might be usefully planted as background plants. Then standard trees might be made more use of. The Hawthorns and Laburnums, of course everybody plants, but the Rose Acacias, the flowering Almonds, *Acacia inermis*, *Rhododendrons*, and Golden Yews might be used to break up and give tone to flat surfaces. Very few planters allow space enough for the trees and shrubs to develop into handsome specimens.

Usually as many things are crammed into bed and border as will produce some effect, and thinning is not thought of till the whole are seriously injured. Seeking after immediate effect is right enough in principle: it is what all thoughtful planters do. But there is a right and a wrong way of doing this. The planter should first arrange in his mind and jot down on a rough plan his main features, allowing sufficient space for full development. For instance, a plant of Hodgins's Holly will in a few years be 10 or 15 feet in diameter, even if directed upwards by occasionally shortening back a robust side shoot, and it will be a folly to plant anything nearer to it of a permanent character than 8 or 9 feet; and the same rule will apply to most of the best class of shrubs. The spiral-growing conifers, the Cypress, the Juniper, *Retinospora*, and *Arborvitæ* must have plenty of space; indeed, these latter are the most effective when used sparingly to break up lines and flat surfaces, although occasionally such things may be gathered into a group with considerable effect. But if I recommend the permanent things to be planted in the positions adapted for them to develop into beauty, I do not advocate barrenness of aspect, and this can be avoided by planting cheap, common things as nurses. The Laurel, the Larch, and other things are adapted to fill up backgrounds and shelter the young, choicer things, which are destined to give character to the place at the same time; and along the front herbaceous plants and annuals may be used to fill up vacant spots till the shrubs and trees require the space. Of course the nurses must be watched, and kept well in hand. This work unfortunately is too often neglected, and much injury results therefrom.

Select Lists of Trees and Shrubs.—I purpose giving here a few select lists of trees and shrubs adapted for different purposes, adding as we proceed a running commentary to notify anything striking in growth or character about any that may seem to require it. I hope this plan will be found useful to the planter not well up in this special knowledge.

Trees for Blinds and Backgrounds.—*Populus argentea* (Silver Poplar), *P. candicans* (Canadian Poplar), *P. fastigiata* (Lom-

bardy Poplar), *Ulmus glabra vegeta* (Huntingdon Elm), *Ulmus montana* (Wych Elm), *Tilia rubra* (Red-twigg'd Lime). The above are all rapid-growing trees, and will bear pruning. The Lombardy Poplar, when young, is an erect-growing tree of shrubby character. The Silver Poplar is a very effective tree, and the Canadian Poplar deserves a place in the home grounds. Then there are numbers of evergreen trees suitable for shelters and forming backgrounds and blinds. The Scotch Fir, the Norway Spruce Fir, the Silver Fir, the Austrian Pine, and the Larch are well suited for certain positions; they are all hardy, and not particular as to soil if the situation is dry. Evergreens of lesser growth will be found in the Evergreen Oak, the green Holly, the common Yew, Lawson's Cypress, the American and Siberian Arborvitæ, and the *Juniperus communis* and others. The Japanese Privets are useful screen plants, being quick in furnishing, and are not unornamental, especially when in flower. Then there are the Laurels where a dense bed of evergreens are required.

Deciduous Trees for specimen or Choice Groups.—The scarlet Maple is seldom met with, but it is a beautiful tree in autumn. The Hawk's-foot Maple has peculiar shaped foliage, from which it derives its name; the tree nurseries are rich in Maples, and more might be done with them. The scarlet Horse Chestnut is of less dimensions than the common form, and is a desirable lawn tree. The Pavias are not so much planted as they deserve to be; they are nearly related to the Horse Chestnut, but are much smaller in every way, and flower late in summer. The scarlet Oak should be planted for its bright autumn tint, and there are many other Oaks not commonly planted which might be used to give variety and character to our Oak plantations. The Lucombe Oak is well worthy a prominent position, and the Turkey Oak may be useful for its handsome shape and rapid growth. The Canadian Poplar is a very handsome large-foliaged tree, and would make a grand avenue tree; and the Aspen Poplar might be planted for the quivering music of its foliage; it should be located near water. There are several kinds of Walnuts which may be planted for their fruit, and which are not unornamental in appearance, and Walnuts are nice trees to sit under in hot weather, as flies and other insects usually avoid them. The Tulip Tree is a grand tree where it thrives, but handsome specimens are far from being common. Planters seem to run pretty much in one groove, and, so far as I have seen, anything that is rare is not selected except by connoisseurs. But there are a host of subjects, really handsome things, capable of inspiring interest, and yet they are usually passed

over. Besides the Tulip Tree, I may name the Maiden-hair Tree (*Salisburia*), the flowering Ash (*Ornus*), the Service Tree (*Pyrus sorbus*), the Catalpa, the Locust Tree (*Robinia*), the Snowy Mespilus (*Amelanchier*), the Bird Cherry, the Fern-leaved Beech, and many good things in Magnolias. The Purple Beech is indispensable, as no other tree can give us its peculiar metallic tint. The Tree of Heaven (*Ailanthus glandulosa*), the Mountain Ash, should be planted for its bright fruit; the double-flowered Cherries and Peaches are excellent foreground plants, and the Mulberry should occupy a quiet corner somewhere. Hawthorns are in great force now in the best nurseries, and both double and single flowered varieties may be had in many shades of colour.

For avenue planting there are the Horse Chestnut, the Spanish Chestnut, the Canadian Poplar, the Beech, the Lime, the London Plane, and the Elms in several varieties and species. For evergreen avenues the Cedar of Lebanon is unequalled, and the Holly for avenues of less extent has its merits, especially for a winter residence. The Laburnum is so well known and appreciated, it is perhaps scarcely necessary to mention it in a list that does not profess to an exhaustive catalogue. Then, again, what a source of beauty there is almost untouched by the average planter in the

Weeping Trees.—Some time ago I was looking at a Weeping Birch standing on a bank, and wishing every planter could see how beautiful and effective it was. Then there are Weeping Beeches and Elms, and the Weeping Lime is really a good thing where a pendant tree of rapid growth is required. It has good foliage, white underneath, and it flowers later than the common form. The Weeping Ash, of course, is an old favourite, and the Weeping Willows add a new beauty to the margins of lakes and rivers. *Sophora japonica* is a very pretty weeping tree for small lawns. More might be done with weeping trees in giving character to both small and large gardens. In all cases they must occupy prominent positions, where their peculiar characteristics can be seen to the best advantage.

Standard Trees.—For the most part standard trees are grafted or budded 4 feet or more high, and have either round or conical shaped heads, though in the case of weeping trees a pendant habit is obtained. The *Cotoneaster microphylla* grafted on the Thorn form pretty weeping trees in miniature, and the *Pyracantha* grafted standard high has a pretty effect when in fruit. Hollies in many varieties may be had as standards. Thorns likewise, and Laburnums, Rhododendrons, Portugal Laurels, Laurestines, and Japanese Privets are useful evergreens. For flowering deciduous specimens the double-blossomed Cherry, the Peach, and the Almond are

desirable things in spring. The Spindle trees (*Euonymus*) in several species when laden with fruit are very effective. *Acer negundo variegata* (variegated Maple) is a very effective little tree for a foreground of choice things, and probably the more recently introduced ornamental Maples from Japan will be found hardy, such as *Acer polymorphum*, *atropurpurea*, etc. The Sweet Bays make neat standards, but are scarcely hardy in our climate; they are, nevertheless, useful when grown in tubs to stand on terraces or in conspicuous positions in the geometrical garden, to break up its flat surface. They should be placed under shelter during severe weather. Standard Laurestines employed in this way are very effective. *Rhus glabra lacinata* is a very pretty little foreground shrub or tree in miniature, and the *Acacia inermis* makes one of the best and prettiest standard trees for town gardens, its small, compact habit rendering it suitable for forecourt gardening. The Golden Yew grafted standard high has a very effective appearance among green-leaved things.

Deciduous Trees and Shrubs of Choice Character.—

Althæa frutex and its varieties are exceedingly pretty plants of compact habit, flowering late in summer; one or two have variegated foliage. They usually grow from 4 feet to 5 feet high. *Berberis vulgaris* (the common fruiting Barberry) has a very ornamental appearance in spring when in blossom, and also again later on when in fruit. Its fruit is sometimes used to make jellies, etc. It shows best when planted on elevated or sloping ground, so that it may stand out prominently. A cluster of it growing on a little eminence by the side of a winding path or road looks well. *B. atropurpurea* is also a very useful variety for a planter who is seeking to create striking effects. *B. asiatica* is a good hedge plant, or for forming screens. The *Calycanthus* (Allspice) should be planted for its scent, *Cotoneaster Simonsi* for its neat habit and bright berries in winter. The *Cydonias* (Japan Quince), such as *rosea*, *alba*, and others, are very desirable, early flowering, low growing plants. The *Mezereum* *Daphne*, that flowers with the Snowdrop and Crocus, and is later on laden heavily with scarlet berries, is one of the most effective little shrubs we have. *Deutzia scabra*, *D. crenata* fl.-pl., and *D. gracilis* are all pretty white flowering spring shrubs. *Forsythia viridissima* and *Fortunei*, the yellow flowers of which come before the leaves early in spring, are very effective, also the Brooms (*Genista hispanica* and *tinctoria* fl.-pl.), Snowdrop Tree (*Halesia tetraptera*), Sea Buckthorn (*Hippophae rhamnoides*), *Hydrangea paniculata grandiflora*, St. John's Wort (*Hypericum elatum*), and others. *Kerria japonica* fl.-pl., *Leycesteria formosa*, and *Liquidambar styraciflua* should be

planted for the brilliancy of their foliage in autumn if for nothing else. The Lilacs are indispensable, and such varieties as Charles X. should, in choice collections of shrubs, take the place of some of the commoner kinds; *virginalis* is a pure white. The Magnolias are a neglected race, the reason being probably that some of them are rather tender, but *Magnolia Lenne* and *M. tripetala* (Umbrella Tree) are hardy, and *M. acuminata* is a grand lawn tree.

The Honeysuckles are well known to everybody as wall and pole climbers, but they are equally beautiful as standards and half-standards in the front of the borders. *Lonicera nigra*, *L. rosea grandiflora*, and *L. tatarica alba* are all useful. The Tree Pæony may be had in numerous varieties, which are so beautiful in spring, either as border plants or in pots for the conservatory, that they will be largely grown some day when their merits are recognised. The Philadelphus (*Syringa*), or Mock Orange as it is commonly called, from its strong fragrance being much akin to the real orange blossom, are also excellent early summer-flowering shrubs. *P. grandiflorus* and *P. speciosissima* are amongst the best; all are white-flowered, two have double flowers, and one has variegated foliage. *Potentilla fruticosa*, *Prunus triloba*, *P. sinensis alba fl.-pl.*, and *P. rosea fl.-pl.*, are very desirable, as are also the following:—*Pyrus Aucuparia* (Mountain Ash), *P. Aria* (White Beam Tree), *P. domestica* (True Service Tree), *Ribes* (flowering Currants), *R. sanguinea* (red), *R. s. flore-pleno* (double red), *R. albidum* (white), *R. aureum* (yellow), *Spiræa ariæfolia* (white), *S. bella* (rose), *S. callosa* (rose), *S. Douglasi* (pink), *S. opulæfolia lutea* (yellow), *S. prunifolia fl.-pl.* (white), *S. Reevesi* (white), *S. salicifolia carnea* (pink). The *Spiræas* are beautiful flowering shrubs, mostly of low growth. The Venetian Sumach (*Rhus Cotinus*) is one of the most beautiful and interesting shrubs for a front plant in the border, or as a single specimen on the lawn. *R. typhina* (Stag's-horn). *Tamarix elegans*, a very interesting elegant little plant of feathery growth, makes a pretty low group on the grass or at the edge of the border—excellent for seaside planting. *Viburnum Opulus* (Guelder Rose), *V. Lantana* (Wayfaring Tree), *Virgilia lutea*, *Weigela rosea*, and *W. amabilis alba* are very pretty and interesting families of low shrubs adapted for pot culture in a collection of hardy plants in a cool house or for forcing, also *Xanthocera sorbifolia*, a pretty, hardy, white-flowered shrub. I do not profess to give more than a selection. If more are required, pay a visit to a large nursery in the spring, when shrubs are mostly in flower.

Select List of Evergreen Trees and Shrubs—*Conifers*.

—Of these I have already referred with approval to the Cedar of

Lebanon, the Cedar of Mount Atlas, *Picea Nordmanniana* and *Picea Pinsapo*. To these I will now add *Picea nobilis*, *Cryptomeria japonica*, *Abies canadensis* (Hemlock Spruce), *Abies Clanbrasiliana*—a dwarf, dense species suitable for small grass plots or planting on rockwork. The *Cedrus Deodara* and the *Wellingtonia gigantea* are ornamental in a young state, but are uncertain afterwards, and it is unsatisfactory to plant a thing one cannot rely upon. *Abies Smithiana* is a handsome tree, and not so particular about soil or situation as many conifers are. The Deciduous or Swamp Cypress (*Taxodium distichum*) is a handsome tree for damp situations on strong soil. A somewhat similar situation also suits the Hemlock Spruce. Of the smaller conifers a more extended list may be made, as the Biotas (Chinese Arborvitæ), the Yews, Thujas, Junipers, and the many forms of Japanese Cypress will succeed in most places. *Biota orientalis*, *B. aurea*, *B. elegantissima*, *B. semper-aurescens*, *Cryptomeria elegans*, *Cupressus macrocarpa*, *C. Lawsoniana*, *C. L. erecta viridis*, *C. L. gracilis*, *C. L. lutea*, *C. L. pendula alba*, *Juniperus chinensis*, *J. hibernica*, *J. prostrata*, *J. virginiana*, *Retinospora filifera*, *R. obtusa*, *R. pisifera*, *R. p. argentea*, *R. plumosa*, *R. p. aurea*, *R. squarrosa*, *Taxus adpressa*, *T. baccata* (common Yew), *T. b. elegantissima*, *T. b. aureo-variegata*, *T. fastigiata* (Irish Yew), *T. f. aureo-variegata*, *Thuja occidentalis* (American Arborvitæ), *T. o. Vervæneana*, *Thujopsis borealis*, and *T. dolobrata*.

Other Evergreens.—*Arbutus Unedo* (Strawberry Tree), *A. Andrachne*, *Aralia Sieboldi*, *Aucuba dentata variegata*, *A. maculata*, *A. japonica vera*, *A. j. luteo-carpa* (yellow berries). Male varieties:—*Aucuba japonica maculata*, *A. japonica viridis*. The introductions from Japan of late years have added to the numbers and increased the interest of this family. It is a very ornamental class, and with the Hollies and Ivies should be largely planted in suburban gardens. A very limited number of male plants will suffice to fertilise a large quantity of female plants if growing in the immediate neighbourhood without any further trouble, as the wind, aided by insect agency, conveys the pollen from one plant to the other. Sometimes the males bloom first, and in that case the pollen must be collected and kept dry till the flowers of the females open, then be dusted among the plants on a fine, dry day. The evergreen Barberries are a large and beautiful family, for the most part bearing yellow or orange flowers in spring. *B. Darwini*, *B. dulcis*, and *B. stenophylla* are free-growing, graceful-habited shrubs. *B. japonica* is less well known, but is very handsome. *B. aquifolium* is one of the best plants for forming masses of undergrowth and covering dry banks. The Barberries should, as

a rule, be planted in a small state, as when large they do not transplant well. *Buxus* (Box Tree), *B. balearica*, *B. japonica*, *B. sempervirens*, *B. s. argenteus*, *B. s. Handsworthiana*, *B. suffruticosa*, *B. s. marginata aurea*. When, as in some cases, a large number of Boxes are planted, it is better to have a number of varieties than to have so many duplicates as are commonly met with, even in well-kept places. *Cerasus lusitanica* (Portugal Laurel), *C. Laurocerasus* (common Laurel), *C. colchica*, and *C. caucasica* are excellent nurses, and useful for blinds and clothing banks, or forming undergrowth beneath trees where the shade is not too dense. *Colletia horrida*, *Cotoneaster microphylla*, *Cratægus Pyracantha*, *Daphne Cneorum*, and *Elæagnus reflexa variegata*. *Euonymus japonicus*, *E. j. aureo-variegatus*, *E. j. ovatus aureo-variegatus*, and *E. radicans variegatus*, are interesting low-growing Japanese shrubs, but several species are of doubtful hardiness.

Holly (*Ilex*): *Ilex aquifolium* (common), *I. altaclarensis*, *I. angustifolium*, *I. flavum*, *I. fœmina*, *I. Hodginsi*, *I. nigrescens*, *I. Shepherdi*, *I. latifolium*, *I. ferox foliis argenteis* (Silver Hedgehog), *I. ferox foliis aurea* (Golden Hedgehog), *I. Golden Queen*, *I. Silver Queen*, *I. Handsworthiana*, and Bronze-leaved. Where the soil is suitable there is no class of plants capable of being used so effectively in villa or other gardens as a collection of Hollies, and with regard to Hollies, the remark I made of the Box applies with still greater force. I know places where there are hundreds of Hollies, and yet all, or nearly all, are the common green variety; and this, when so much variety can be had, is, I think, a great mistake. *Laurus nobilis* (Sweet Bay), *Ligustrum* (Privet) *japonicum*, *L. j. aureum variegatum*, *L. j. ovalifolium*, *L. j. o. elegantissimum*, *L. j. pendulum aureum*. The Japanese Privets are very ornamental, fast-growing shrubs. *Magnolia grandiflora* (Exmouth variety) for warm, sheltered places, and on south or west walls. The Laurustines are all pretty, and are especially desirable, as they flower in winter and spring. They often suffer during severe winters north of London. *Osmanthus myrtifolius*, *O. ilicifolius*, *O. argenteo-variegatus*, *O. aureo-variegatus*, *Phillyrea angustifolia*, *P. buxifolia*, *Quercus Ilex* (evergreen Oak), *Raphiolepis japonica* (Indian Hawthorn), *Hippophae rhamnoides* (Buckthorn), *Pernettya angustifolia*, *Skimmia japonica*, *S. j. oblata*—useful for winter effect when in fruit—Lavender, Rosemary, and Southernwood produce striking effects when disposed in large patches or groups on banks or in front of shrubberies; *Spartium junceum*, *Ulex europæa fl. pl.* (double Gorse), *Vinca major*, *V. m. elegantissima*, *V. minor*, *V. m. aureo-variegata*. The Periwinkles or Vincas are especially adapted for dry banks or under trees, where little else

will grow. *Ruscus aculeatus* (Butcher's Broom), *R. racemosus*, *Yuccas* (Adam's Needle), *Y. filamentosa*, *Y. f. variegata*, *Y. gloriosa*, and *Y. recurva*, though not exactly shrubs, are generally classed as such. They are quite indispensable in every phase of ornamental gardening, being as suitable for the wild garden as for the most elaborate geometrical design.

The Tree Ivies : *Hedera arborea*, *H. a. tricolor marginata*, *H. a. marginata argentea*, *H. a. aurea maculata*, *H. a. luteo-baccifera* (yellow fruited), *H. a. palmata*, *H. a. canariensis*, and *H. Rægnieriana*. The Tree Ivies are, I think, destined to become popular, being so cheerful looking in winter.

Variegated Trees and Shrubs.—Though some look upon variegation as a disease (and when bred too finely perhaps it may be), all plants having a fair proportion of green in their leaves are healthy and long-lived ; for instance, the variegated Holly, the Box, and *Aucuba*, are as hardy as the green-leaved forms. Doubtless some of the golden-leaved plants, where there is at certain seasons an almost total absence of green, are delicate. The golden Catalpa may be cited as a case in point, yet the majority are hardy and healthy, and no garden is complete without some of them, as they give such a warm glow of colour in winter. Below I append a selection of the best and hardiest of all sections of variegation, and the curious in such matters may extend the list considerably. Of trees of large growth there is the variegated Elm, the purple Beech, the scarlet Oak (*Quercus coccinea*), the golden Oak (*Q. concordia*), the purple Oak (*Q. Robur atropurpurea*), the purple Birch (*Betula alba purpurea*), golden Poplar (*Populus canadensis* Van Geerti), silver Poplar (*P. argentea*), scarlet Maples (*Acer sanguineum* and *A. Colchicum rubrum*), the silver Maple (*A. Negundo variegatum*), golden Laburnum, the silver Willow (*Salix argyrea*), the variegated Philadelphus, or *Syringa*, as it is commonly called, the two forms of variegated Elder, gold and silver.

To return to the Maples again for a minute, there are plants of elegant habit and splendid colouring among the newer Japanese Maples. At present they have only been sparingly used by planters, and it is yet premature to speak as to their hardiness in all situations, but when better known I anticipate they will be sought after, first for the decoration of the greenhouse and conservatory, and afterwards in the parterre where choice shrubs are employed, to give character. *Acer dissectum roseum marginatum*, *A. palmatifidum ornatum*, *A. polymorphum atropurpureum*, *A. septemlobum reticulatum*. The golden Chestnut (*Castanea aurea*), variegated Dogwood (*Cornus mascula elegantissima aurea*), *Kerria japonica variegata*, *Symphoricarpus vulgaris variegatus* (variegated Snow-

berry). Among evergreens there are many with golden and silver-tinted foliage, and their numbers are annually increasing. There are many conifers, especially among the dwarf species, with variegated growth. Many among the *Thujas*, *Yews*, and *Cypresses*, are beautifully tinged with gold, especially in spring when the young growth bursts forth. *Biota aurea*, *B. elegantissima*, *B. semper-aurea*, *Cryptomeria elegans*, very effective in winter, the whole tree assuming a bronze colour; *Cupressus Lawsoniana aureo-variegata*, *C. L. lutea*, *C. argentea variegata*, *Retinospora obtusa aurea*, *R. plumosa aurea*, *R. gracilis aurea*, *R. squarrosa*, *Thuja Vervæneana*, *Juniperus chinensis aurea*, *J. c. albo-variegata*, *Taxus baccata aurea*, *T. b. elegantissima*, *T. fastigiata aurea variegata*. The variegated *Hollies* are very numerous and elegant, either for forming into groups or as occasional single specimens. The *Silver Queen*, *Golden Queen*, the *Golden Milkmaid*, *Golden Hedgehog*, *Silver Hedgehog*, *Handsworth* (silver striped), *Waterer's gold striped*, the *Bronze-leaved*, and many other varieties. Then the *Boxes* are a large family, and there are but few places where more variety is not desirable. Though most of the *Euonymuses* suffer during severe winters north of London, yet some of them should be grown, even if they have to be sheltered in winter. The dwarf variety, *E. radicans variegatus*, is quite hardy, and of the others the hardiest are *E. japonicus latifolius variegatus*, and *E. j. aureo-marginatus*. There are several variegated varieties of Japanese *Privet* worthy of notice, especially *Ligustrum japonicum aureum variegatum*, and *L. j. ovalifolium variegatum*, *Osmanthus ilicifolius argenteus*, *Eleagnus reflexus foliis variegatus*. There are several pretty variegated forms of tree *Ivy*, especially *tricolor marginata*, *marginata aurea*, and *aureo-maculata*. The variegated *Periwinkles*, especially *Vinca major elegantissima*, will be found useful.

Importance of timely Thinning of Shrubs.—It is a misfortune when the planter's ideas are not grasped by his successors, as his best efforts may take many years to develop; for the best and choicest trees and shrubs are generally of slow growth, hence the importance of intelligent watchfulness and supervision. The *Larch*, the *Laurel*, and the *Privet*, which are largely used as nurses, if neglected, will soon overtop and destroy the choice things they were intended to shelter and protect. In keeping rampant growing things within bounds a good deal may be done with the knife, and then as they progress, if not too large, the overshadowing nurse may be removed and planted elsewhere. In new neighbourhoods there is often a demand for common things of large size, to form screens and blinds, and sometimes the thinnings of shrubberies may be disposed of to advantage in this way. At any rate, when-

ever the best plants require the space the nurses must give way, even if they have to be destroyed. For the first few years but little will be required beyond annual regulation with the knife, and all things require a little help sometimes. It may be that a strong growth has been developed, which is monopolising the strength of the plant and injuring the natural leader, and this should be checked in time. With the majority of permanent trees and shrubs the knife should be used only to secure the symmetry of the plant, or, in other words, to maintain the balance of power ; but as regards the nurses, or those things planted for shelter only, when they have served their intended purpose there should be no hesitation about dealing with them, either with knife or spade. The common Laurel, besides being an excellent plant for making blinds, and for nursing tender things, may be used with excellent effect in covering banks, or for creating a green base for pictorial trees, such as the Weeping Birch and the variegated Holly. When submitted to an annual pruning to keep them low, they produce a striking effect.

Climbers for Buildings, Walls, etc.—The most unsightly building may be made beautiful by a covering of living plant growth. Let but a spray of Ivy attach itself to a hard, bare brick wall, and gradually it steals upwards, spreading out laterally as it advances, imparting a tone and finish to the dead face of the wall or building in a way which no hand of man can rival. Creepers on the outside of the dwelling are on a par with the paper and curtains of the interior, and they add to its appearance in proportion to the value of the materials employed. A Rose-covered cottage would to some minds be preferable to one covered with Ivy, but the Ivy should not be despised, as it will succeed where Roses would fail. Old-fashioned houses of a mixed style of architecture may be appropriately covered with creepers in variety. Roses, Clematises, Honeysuckles, and Jasmines may blend in one sweet mixture, festooning over verandahs, or rambling up the gables. But in modern houses there is often an advantage in planting each aspect with a different kind of plant ; the south side, for instance, may be covered with Roses, using such rapid growing kinds as *Maréchal Niel* and *Gloire de Dijon* to cover the upper part and ramble about the chimneys, with the less vigorous *Teas* and a few of the strong growing Hybrid Perpetuals for clothing the bottom. The western aspect would look well covered with the *Pyracantha*. Though its growth is slow, when once the wall was covered the effect would be permanent, and it is worth waiting a few years for. The north might be covered with Veitch's variety of the *Virginian reeper*, which clings to the wall like Ivy. The foliage dies off in

autumn a beautiful bronze, superior to anything else of the kind, and the habit of growth is close and neat. Many of the hardy evergreens and deciduous shrubs are well adapted for covering walls of only a moderate height. The evergreen Barberries (*stenophylla* and *Darwini*), the *Laurustinus*, the *Cotoneaster* (with its neat foliage and brilliant scarlet berries), the *Escallonia macrantha* (deep green, glossy leaves and bright rose-coloured flowers late in autumn, when flowers are scarce), and *Euonymus radicans variegata*, with its close habit and neat, variegated foliage, can be highly recommended as samples of a much larger list. Of deciduous things we might select the *Wistaria sinensis*, the *Forsythia*, the naked-flowered Jasmine, the Honeysuckles, the Japan Quince (*Pyrus japonica*), *Chimonanthus fragrans*, *Magnolia conspicua*; and the very large family of *Clematis* are a host in themselves. A wall might be made very effective in this way. Plant Clematises, either of the Jackmani or lanuginosa type, 10 feet apart, allowing each plant to spread 3 feet. In the panels between the Clematises plant variegated Ivies, of which there are now so many beautiful varieties, allowing one kind to each panel. When the wall was well furnished the effect would be very chaste.

Many other ways of planting walls with creepers will occur to those who turn the matter over in their minds, and these would be an agreeable change from the mixed system commonly adopted. In all cases where creepers are planted, unless the site is in good order, some pains should be taken to fit it for them before planting. If needed, manure and fresh soil should be brought, and if these are not required the border should at least be deeply dug. Wherever Roses are planted a little extra pains should be taken, as Roses in weight of flowers alone dissipate a good deal of nutriment, and this must be given to them in some form, and liquid manure cannot easily be applied just under the windows. Walls or buildings on which climbing plants are to be trained should be wired, as this does away with the necessity of using nails or shreds, and besides, there is a saving in it. Of course wires are not needed for Ivies. There are many ways in which creeping and climbing plants may be employed to adorn a garden besides taking the harshness and bareness from walls and buildings. The Virginian Creeper, the *Wistaria*, the Honeysuckle, and the *Clematis* may be planted near stiff-growing trees or shrubs, up which they may be trained till they have reached the top, then encouraged to fall about gracefully and naturally. Then they will cover wire screens and quickly shut out any unsightly object. The Hop is a very useful summer climber, and there are annuals which may be raised from seeds sown in spring that will cover a large space in one

season, the Canary Creeper being as effective as anything of the kind can possibly be.

Select Climbers and other Plants for Walls.—*Ampelopsis Veitchi*, *A. hederacea*, *Aristolochia Sipho* (Birthwort), *Berberis Darwini*, *B. stenophylla*, *Ceanothus thyrsiflorus* (south aspect), *Bignonia grandiflora*, *B. radicans major*, *Cotoneaster*, *Escallonia macrantha*, *Euonymus radicans variegata*, *Garrya elliptica*; Ivies, a very great number, including such beautiful kinds as *aureo-maculata* (clouded gold), *Emerald Gem*, *japonica argentea*, *latimaculata*, *marmorata elegans*, *marginata argentea*, *palmata*, *palmata aureo-purpurea*, *Rægneriana*, *tricolor variegata*, *baccifera lutea*, *salina elegantissima*, etc. Honeysuckles, Jasmînes, and *Clematis* are numerous enough to suit the most fastidious. The Honeysuckles and *Clematis* are well suited to train round doors and windows, even when the other parts of the building are clothed with other plants. *Magnolia grandiflora* is a grand plant for a warm southern situation. I have seen plants of this 70 feet high in the West of England. For southern aspects *Passiflora cœrulea* Pomegranates, *Pyrus japonica*, and *Pyraeantha*. Roses in great variety. *Stauntonia latifolia* (a fast-growing climber in a warm aspect), *Vinca major elegantissima*. Grape Vines are pretty wall plants, and when well cultivated their fruit is useful, but I shall have something to say about this further on. *Chimonanthus fragrans*, *Wistaria chinensis*, and the *Laurustinus*.

CHAPTER III

The Lawn.—What is commonly termed the lawn assumes a variety of characters. There is the formal lawn, which it is customary for the architect to embellish with steps, often with walls, and sometimes with statuary. The outline is generally square, or at least straight lines prevail, and the surface is flat, and sometimes intersected by green slopes. This is an expensive lawn to make and keep, though in its best form it is not without a certain degree of grandeur when placed in front of a modern Grecian or Italian villa. But this kind of lawn broken up into formal walks and terraces does not look well on a small scale, as it wants breadth and depth to show it off to the best advantage. If the terraced garden is introduced in small places the elevations should be in proportion to the size of the place. Short slopes are best if there is only a moderate elevation for villa gardens of small dimensions—that is, if it is necessary to introduce the terrace-garden system at all; but I cannot help thinking that when the garden does

not exceed half an acre, the terrace system does not fit in so well as when the plants and shrubs are disposed in a more natural manner. There are many ways of making a lawn, and there is more than one plant adapted for small lawns. Turf composed of a mixture of grasses, with generally a certain proportion of weeds, is the material commonly employed for covering the ground in front of the house, and which we call a lawn. There are many advantages in having the ground in the immediate front of the house covered with something that will bear walking or running upon—where little feet may dance about to their hearts' content without doing any damage—and turf forms the best medium. Local circumstances will sometimes guide us as to the formation of the lawn—whether it shall be laid with turf or sown with seeds. In either case the ground should be well prepared, and, if possible, it should be free from the seeds of weeds, which implies that it has been under cleanly cultivation for some time previously. If grass seeds are sown it is very important that the land should have undergone a course of cleanly culture for a year or two, and unless turf can be obtained very cheaply in the neighbourhood I should certainly recommend grass seed in preference. The site of the proposed lawn should be dug over, and if the ground is poor, a dressing of manure will be beneficial. The surface should be raked fine, removing all stones and roots or other foreign matters, so as to secure a fine tilth. It will be better if the digging can be done a month or two before it is necessary to sow the seeds, as exposure to the weather will improve the working, especially if the soil is heavy. The seeds may be sown in September, if it is convenient, as early in the month as possible, as then a good plant will be obtained before winter sets in. I have seen a good turf secured the following spring from September-sown seeds.

Next to September the best time to sow is towards the end of March or beginning of April. In the preparation of the surface for the seeds the same amount of pressure should be applied all over, or it may settle unevenly and give trouble. To obtain a good turf quickly from seeds they must be sown thickly. At least 4 bushels per acre should be sown. And for small lawns near trees, or where birds are numerous, 6 bushels per acre will not be too much, as the birds will take some. One—I may say the chief—reason why lawns from seeds take so long to establish is, that the seeds are too thinly scattered about. The same pains should be taken in preparing the land where turf is employed in applying pressure equally all over the surface, so that the lawn may settle evenly. Lawns newly planted with seeds or turf should be skimmed over lightly with the scythe several times

before the machine is used. And where seeds have been used for forming the lawn the machine should at first be set to cut rather high. I need hardly say the roller will be a most useful implement to thicken and form the turf. For small suburban lawns, instead of employing turf, the small-leaved or the large-leaved Irish Ivy would make a pleasant green patch. Of course it would not bear the pressure of much traffic, but it would look well and would make a nice base for Daffodils and other bulbs in spring. It would bear cutting to any extent in order to keep it close to the ground. The expense of forming an Ivy lawn would be small, as cuttings planted in autumn would do; pegged down close to the ground, the bare earth would be covered in one season. There are other substitutes for Grass perhaps as useful as Ivy. A well-known town plant called Creeping Jenny I have seen employed with considerable effect. And it might be used even where Ivy was employed to form contrasting patches or to fill in recesses. The Creeping Jenny is otherwise known as the Moneywort, or *Lysimachia Nummularia*, and is a common British plant. But wherever a lawn is required for traffic it must be formed of turf. The advantages of planting the open spaces usually turfed over with one or more green creeping plants are very considerable in point of expense, as a well-kept grass plot involves a good deal of labour, and unless it is well kept the Ivy or the Moneywort will look better.

Management of Water.—If a natural river flows within view of the windows of the house, one of the chief features of a beautiful landscape is for ever present without cost. There are places in rural districts where a little streamlet can have its course so altered and expanded by labour and fashioned by art as to become a charming artificial lake. Not far from where I am writing there is a country rectory with an exceedingly pretty miniature lake attached to its grounds. Many years ago a former proprietor led a little stream away from the meadow near, and caused it to wind about in a picturesque manner through the margins of the lawn. Just opposite the windows it opens out into a rather broad sheet of water, where it ripples and sparkles in the sunlight in a delightful manner. Trees of various kinds, including those of weeping habit, were planted on the banks, their branches drooping down to the water in which they are reflected. Openings and vistas are left in the trees, and over the lake to the country beyond the view extends for some distance, making as charming a landscape as one would wish for. A rustic bridge and a tree and shrub-clad island are among the accessories which add to the effect. The lawn dips down to the water without any formal or sharply defined edge, and

altogether the outlines of the little lake are so easy, graceful, and flowing, as to suggest the thought that man has had but little hand in the work of placing it there. It is not every person, even among those who have some taste in such matters, that can be trusted to design and carry out the creation of artificial water of an ornamental character, so as to make it harmonise with surrounding objects without any harsh lines or incongruous features.

Wherever there is a running stream near, something might be accomplished, and in a land so full of water as our own, more might be done to turn that indispensable fluid to ornamental purposes without injury to its utility. In my rambles about the fields I often come upon a pond just as it came from the hand of Nature. I saw one lately—it was only a little one—with clustering Thorns, and Dog Roses, and old Pollard Elms on the bank, which would have delighted the heart of a painter. Though all may not be able to improvise a lake, or even a pond, with the Weeping Birch, the Willow, and the Rhododendrons clothing its margin, yet ornamental water in some shape or form is within the reach of all. A single tub sunk in a corner under the light shade of a Weeping Birch, and filled with water, will furnish an interesting home for some of the smaller aquatics. Such a tub full of Callas or Ethiopian Lilies will all summer be an object of interest, and in winter will require no special care; and this idea might grow to any reasonable extent. I have grown aquatics in large flower-pots with the holes in the bottom puddled up with clay after a cork had been inserted, and a group of large No. 1 pots on the lawn (sunk in the ground in some inconspicuous corner) full of water plants is calculated to attract the attention of the thoughtful person, and would be within the means of everybody. If the water supply of the place is sufficient a shallow pond for Water Lilies may be made, a pipe being led into it from the main water supply. The shape of the pond may be oval or circular, and it may be made of any size from 10 feet or 12 feet in diameter up to 30 feet. The earth excavated may be used for creating banks for the fernery or an alpine mound.

The bottom and sides of the Lily pond must be puddled with clay, and on the puddle should be placed a foot at least of good loam and manure to plant the roots of the Lilies in. The White Lily (*Nymphæa alba*) is the most beautiful, and the flowers are so useful for cutting. Other aquatics may be grown in the Lily pond if it is large enough, and variety is always charming. The pond can be kept up to its full height by the pipe which leads into it being turned on for a short time each day. In some cases it may

be possible to extend the aquatic idea by permitting the overflow from the pond to descend through an artificially-created bog, and which will be mainly a question of labour, and can be made by instalments. The soil should be excavated to a depth of 2 feet or so, and the bottom be puddled with clay, and on the clay a bed of peat should be laid. A perforated iron pipe should run through the bog for the purpose of supplying water when necessary. The bog may either be in connection with the Lily pond or be a separate and independent idea; but these are details which will suggest themselves to any person of intelligence who thinks the matter over. I append a list of

Aquatic and Bog Plants.—The following may be of use to beginners:—*Nymphaea alba*, *N. odorata* (white Water Lilies), *Nuphar lutea* (yellow Water Lily), *Butomus umbellatus* (Flowering Rush), *Menyanthes trifoliata* (Buck Bean), *Hottonia palustris* (Water Violet), *Acorus calamus* (Sweet Flag), *Alisma Plantago* (Water Plantain), *Calla palustris* (Bog Arum), *Calla æthiopica* (Ethiopian Lily), *Aponogeton distachyon* (Cape Pond Weed)—this is a lovely little plant with Hawthorn-scented flowers, and may be easily grown in an earthenware pan in the open air or greenhouse, or in a room—*Caltha palustris* (Marsh Marigold), *Iris Pseudacorus* (Water Flag), *Pontederia cordata* (Pickerell Weed), *Sagittaria sagittifolia plena* (Double Arrowhead), *Typha angustifolia* (Long-leaved Cat's-tail), *T. latifolia* (Cat's-tail Flag), *Orontium aquaticum* (Golden Club) *Stratiotes aloides* (Water Soldier), *Tulbaghia alliacea* (Water Onion). Among what are termed bog plants are *Arundo Donax* (Great Reed), *Astilbe rivularis* (False Goat's-beard), *Bambusa Metake* (Bamboo), *Cypripedium spectabilis* (Lady's Slipper)—a beautiful orchidaceous plant, should occupy the highest and driest part of the bog—*Gunnera scabra*, *Habenaria ciliaris* (yellow-fringed Orchis), *H. nivea* (Surrey Orchis), *Juncus conglomeratus variegatus* (Variegated Rush), *Lobelia cardinalis*, *Lysimachia clethroides* (Loosestrife), *Mimulus cardinalis* (Monkey flower), *Myosotis palustris semperflorens* (Forget-me-not), *Osmunda regalis* (Royal Fern), *Phormium tenax* (New Zealand Flax), *Polygonum Sieboldi* (Siebold's Buckwheat), *Saxifraga aquatica* (Water Saxifrage), *Sarracenia purpurea* (Hardy Pitcher plant), *Spirea Aruncus*, *S. palmata*, *S. Ulmaria fl.-pl.*, *S. venusta*; all the *Spireas* or Meadow Sweets are beautiful, also *Lythrum Salicaria* and *L. rubrum compactum*. Besides these named above there are the families of *Carex* (Sedges), *Equisetums* (Horsetails), *Epilobiums* (Willow Weeds), *Eriophorum* (Cotton Grass), *Iris* from Japan and elsewhere, *Trilliums* (Wood Lily), that might be planted *en masse* to create special features if the bog was extensive.

The Pampas Grass associates well with water, and does excellently on a raised mound in the midst of the bog.

The Hardy Fernery and Alpine Garden.—There is plenty of scope for taste in the arrangement of the hardy fernery. The site should be a secluded one, sheltered by shrubs, and if partially shaded the wants of the different species can be better provided for than if fully exposed. The rockery or alpine garden and the fernery may be separate and distinct features, and with these may blend the American garden, employing the American shrubs to form groups and backgrounds for the Fern and alpine mounds. Many of our British Ferns, as well as the exotic alpiners, will thrive in borders on the natural level, yet their culture is made more interesting when collected together in some picturesque arrangement. The surface of the ground when flat can be thrown into irregular mounds, with winding paths intersecting the various groups, and rustic steps to form the connecting links between the different levels. Logs and rough billets of wood, or roots of large trees when they can be obtained, may serve to give character to the fernery, reserving the stones to form the rockery for the choice alpiners. The summits of the mounds may be appropriately clothed with American plants. Where there is a good depth of soil Rhododendrons and Azaleas will thrive, and both the American and Japanese conifers will be at home.

Much can be done by judicious planting to tone down that bare, bald appearance ferneries and rockeries have when nothing but Ferns and alpiners are grown, and shrub and tree growth are quite appropriate in such positions. *Abies Clandbrassiliana* is well suited to crown a Fern or alpine mound, and the names of other suitable subjects will be given in a list hereafter. Most of the designs of rockeries that I have seen in books somehow disappoint me. They carry in their outlines too much of the impress of the professional builder. If it is not possible to imitate in some simple way the geological formation of a district, it is better, I think, to cast the stones down as if placed there by some eruption of Nature than build up an elaborate affair such as one frequently comes across in suburban gardens. It is a matter of taste, I know, and if the plants will grow well, it may, perhaps, be immaterial how the work is constructed. Some of the more delicate-rooted alpiners require a mixture of rock débris to grow in. Again, some of the Ferns require a dry bank; others, such as the Marsh Fern and the Royal Fern, must have moisture; all the Harts'-tongues, for instance, require shade and a moist atmosphere, yet there must not be too much moisture at the root. In the matter of soil the same variation exists. Most of the Ferns and

many of the alpine will grow in good ordinary garden soil, but there are a few for which special preparation must be made. In constructing the beds or mounds for both Ferns and alpine, it will be best first to excavate the paths forming the mounds with the soil thrown out, keeping the bad subsoil in the bottom. When the work is completed the rustic arches, if any are needed, should be built. Arches roughly built of stone, and covered with creepers or Ivy, have a telling effect. Arches built with rough Oak for creepers also look well. The roots or logs of timber should be disposed in as natural and pleasing a manner as possible; and the site for any dwarf conifers or other plants should be prepared first of all before any elaborate fixing of stems or logs takes place; and in the arrangement of the shrubs or plants of large growth, they should not be set out on any regular formal system, but arranged as naturally and informally as possible. Sometimes a dwarf conifer, or a Barberry, or a Mountain Ash, may grow out of the summit of the mound; at other places it may seem to be clinging to the side. Again, occasionally a group may be dropped down in some suitable position to avoid the sameness which too many single specimens dotted about would inflict on us. These and many other necessary details, which can only be glanced at here, will require careful thinking out by the planter.

CHAPTER IV

Laying out the Alpine Garden.—If this is formed in connection with the fernery it should occupy the sunniest position, as shady spots for those alpine which love shade can always be improvised by placing a shrub or a stone on the sunny side. Ambitious persons may succeed in obtaining pleasing imitations of alpine scenery on a small scale, if they go the right way to work, without any stones at all. An imitation mountain, with a towering peak, may be obtained without difficulty. The peak, of course, must be planted with the Snow plant (*Antennaria tomentosa*), a close-growing, white-foliaged plant, having the appearance of snow when viewed from a distance. The sides of the miniature mountains must be clothed with suitable vegetation, and in planting an alpine mound there is scope for a good deal of taste and ingenuity; and such a feature is calculated to inspire a good deal of interest without incurring much expense. All the various kinds of Ivies may be utilised in the rockery or fernery, or their immediate neighbourhood, such as the approaches to their site. Some of the most ornamental may climb over trunks of trees set upright in

the ground ; others may cover arches or be trained to poles, and the tree Ivies may occupy salient points anywhere. The *Pyra-cantha*, the *Cotoneaster*, and other berry-bearing plants, such as *Aucubas*, *Skimmias*, and *Pernettyas*, may fill prominent positions on rockwork or elsewhere ; and here beautiful large irregular patches of the hardy *Heaths* will appear growing on the side of the banks or wherever suitable positions can be found. Having thought of the hardy things that require no special preparation beyond good soil, the plants that are considered delicate or miffy will come on after, and the wants of these must be specially studied. A good deal of knowledge may be gleaned of the soil and treatment a plant requires, from its appearance and especially from its root structure. All plants with fine hairlike roots do best in peat ; strong, thick-rooted plants require a strong, deep loam to bring out their true characteristics ; whilst the medium-rooted plants should have sandy loam. This will probably be considered a somewhat rough estimate, but it will be found in the main correct.

In Planting both the fernery and the alpine garden it will be best to group each family by itself, as this enables us to give each the right treatment ; it will, besides, make the collection more interesting. In the course of time some plants will spread out into large masses, and there will always be a danger of the strong growers destroying the weakly plants unless constant watchfulness is exercised. All plants like depth of soil—even the most delicate species, but in the case of these, pieces of rock or rocky débris should be intermixed to secure the porosity required. Road drift—that is, the sandy deposit which accumulates after heavy rains by the sides of the road—will be suitable for mixing with peat or loam or leaf-mould for many plants. It frequently happens that rare delicate little plants which refuse to grow under the usual treatment will flower in a mixture of earth and charcoal. Again, many of the choicer alpiners, though they are not particular as regards food, want full exposure. The plant that in its native habitat grows in the cleft of a rock on some steep mountain side does not take kindly to the confined atmosphere of a place overhung by trees. All these and many other details will have to be thought out before all the rare choice alpiners will stay with us ; but, though this is so, yet the beginner need not be alarmed, as by far the greater number of alpiners will flourish under good ordinary cultivation such as is given by people who love their flowers.

Select Plants for Fernery.—In making the following short list I have given here and there a few hints as to their treatment, because some like shade and dampness, others do best in a well-

drained position :—*Adiantum pedatum*, *Allosorus crispus* (Parsley Fern), *Asplenium Adiantum nigrum* (black Maiden-hair), *A. fontanum*, *A. germanicum*, *A. lanceolatum*, *A. Halleri*, *A. trichomanes*, *A. viride*, *A. Ruta-muraria* (Wall Rue), *Athyrium Filix-femina* (Lady Fern), *A. F.-f. coronatum*, *A. F.-f. crispum*, *A. F.-f. Elworthi*, *A. F.-f. Frizelliae*, *A. F.-f. grandiceps*, *A. F.-f. plumosum*, *A. F.-f. multifidum*, *A. F.-f. Victoriae*. The *Athyriums* are deciduous, and will thrive well in loam and leaf-mould or loam and peat in a partially-shaded position inclined to dampness ; *Ceterach officinarum*, *Cystopteris fragilis*, *C. f. Dickieana*, *C. f. montana*, *C. alpina* must have a well-drained, stony site, partially shaded ; *Blechnum Spicant*, *B. S. concinnum*, *B. S. cristatum*, *B. S. imbricatum*, *B. S. heterophyllum*, low-growing evergreen Ferns, will grow in good soil anywhere ; *Cyrtomium falcatum*, *Lastrea Filix-mas* (male Fern), *L. F.-m. crispa*, *L. F.-m. cristata*, *L. F.-m. furcans*, *L. F.-m. Barnesi*, *L. F.-m. polydactylum*, *L. dilatata cristata*, *L. Goldieana*, *L. intermedia*, *L. marginalis*, *L. Standishi*, a most interesting family, of strong, vigorous habit, nearly evergreen, not particular to soil or situation ; *Lastrea montana*, *L. thelypteris* (Marsh Fern), *Osmunda regalis* (Royal Fern), *O. r. cristata*, *O. cinnamomea* ; the Marsh and Royal Ferns delight in moisture when growing, the latter succeeds well on the banks of a stream or pond. *Onoclea sensibilis*, *Platyloma atro-purpurea*, *P. rotundifolia*, *Polypodium vulgare*, *P. v. crenatum*, *P. v. cambricum*, *P. v. pulcherrimum*, *P. v. cristatum*, *P. v. omulacerum*, *P. alpestre*, *P. a. flexile*, *P. Dryopteris*, *P. phegopteris*, *P. calcareum*, *P. hexagonopterum*.

The Polypodies are low growing, mostly evergreen, and grow freely on dry, stony banks, or decaying wood :—*Polystichum aculeatum*, *P. a. proliferum*, *P. angulare cristatum*, *P. a. gracile*, *P. a. lineare*, *P. a. proliferum*, *P. a. imbricatum*, *P. a. grandiceps*, *P. setosum*, *P. vestitum venustum*. The *Polystichums* are a very effective group of evergreen Ferns, will do well in a partially shady situation, loam and leaf-mould, site to be well drained. *Pteris aquilina* (common Brake), *Scolopendrium vulgare*, *S. v. bmarginatum cordatum*, *S. v. contractum*, *S. v. crispum*, *S. v. digitatum*, *S. v. laceratum*, *S. v. ramosum majus*, *S. v. subcornutum*.

The Harts'-tongues are a numerous family ; strong loam and leaf-mould suits them well. The position should be lightly shaded, and they thrive best near water. The rocky banks of a river where they catch the moist exhalations which arise from the water is where I have found the most luxuriant specimens. *Struthiopteris germanica*, *S. pennsylvanica*, *Woodsia hyperborea*, *W. Ilvensis*,

Woodwardia areolata, W. aspera, W. angustifolia. The above list includes many of the most beautiful and interesting British Ferns, and a few of the best hardy exotics.

Ornamental Plants suitable for the Fernery.—Arundo conspicua, A. Donax, Arundinaria Falcata, Bambusa Metake, Carex japonica variegata, Pampas Grass, Phormium tenax, Gunnera scabra, Equisetum sylvaticum, Aralia Sieboldi, Chamærops excelsa, C. humilis, C. Fortunei, Farfugium grande, Iris foetidissima variegata.

Alpine or Rockery Plants.—A long list might be made of bright showy things which are at home on the rockery, and in many instances in the herbaceous border also, with no preparation beyond what good cultivation in all cases gives. Of these may be mentioned the Alyssums, Aquilegias, Aubrietias, Campanulas, Cerasiums, Cheiranthus, Primulas, Iberis, Silenes, Veronicas, Thymes, Saxifrages, Sedums, Sempervivums, etc. Nearly, if not quite all the following list of plants may be cultivated without more difficulty or thought than must be given to the same number of exotic species from Africa, Australia, or any other country:—Aubrietia grandiflora, Androsace sarmentosa, A. carnea—the Androsace should be planted amid the débris of crushed or decaying rocks intermixed with good soil—Æthionema cordifolium, Acæna Novæ-Zelandiæ, Anemone apennina, A. fulgens, A. pulsatilla, Antennaria tomentosa, A. dioica rosea, Antholimon glumaceum, Alyssum speciosum, Anthyllis montana, Arabis lucida variegata, Armeria plantaginea rubra, Campanula garganica, C. pulla, C. turbinata floribunda, C. t. f. alba, Calandrinia umbellata (sandy peat in the clefts of rockwork), Convolvulus mauritanicus, Dianthus alpinus, D. deltoides, D. petreus. All the alpine pinks are beautiful (mix a little peat with the soil), Draba gigas, Erysimum rupestre; Erimus alpinus does well on old walks or on stones that are perishing. Gentiana verna, G. acaulis, G. cruciata. The Gentians like gritty soil and a good supply of moisture. Geranium sanguineum, Gaultheria procumbens (should be planted in peat fully exposed), Globularia trichosantha, Gnaphalium leontopodium, Geum montanum, Hesperoscordum pumilus (is fond of moisture); Helianthemums (Rockrose), an interesting class of plants, suitable for covering rocky banks in dry situations; Lithospermum fruticosum, Linaria alpina, L. pallida, Lychnis Haageana, L. Lagasce, Mesembryanthemum uncinatum, Mazus Pumilio, Myosotis rupicola (damp situations), Papaver nudicaule, Phlox stolonifera, P. setacea atropurpurea, P. The Bride, P. Nelsoni, P. procumbens, P. frondosa (very effective close-spreading plants, light sandy soil), Polygonum vacciniifolium, Primula farinosa, P. cortusoides amœna, P. nivalis, P. cashmeriana, P. marginata, P. denticulata, P. ciliata, P. viscosa.

The Primroses are among the most interesting border and rock plants. A rather shady situation, moist and yet not stagnant, suits them best. *Ramondia pyrenaica*, *Saponaria ocymoides*, *Saxifraga longifolia*, *S. cæsia*, *S. cristata*, *S. pyramidalis*, *S. hypnoides*, *S. juniperina*, *S. rosularis*, *S. lingulata*, *S. oppositifolia*, *Sedum elegans*, *S. Ewersi*, *S. rupestre*, *Sempervivum californicum*, *S. montanum*, *S. globiferum*, *S. hirsutum*. The three genera last named are excellent rock plants, and many beautiful species may be added to my list. Their culture is very easy. *Silene alpestris*, *S. acaulis*, *S. maritima flore-pleno*, *S. pennsylvanica* (plant in dry stony places), *Iris reticulata*, *Sisyrinchium grandiflorum*, *Soldanella alpina* (moisture and shade), *Statice incana*, *Thymus lanuginosus*, *T. micans*, *Dryas octopetala*, *Sibthorpia europæa*, *Veronica incana*, *V. Lyalli*, *V. prostrata*, *V. repens*, *V. rupestris*, *Vinca minor argentea variegata*, *V. major elegantissima*, *Viola pedata*, *V. p. bicolor*, *Cyclamen europæum*, *C. hederæfolium*, *C. h. album*, *C. h. græcum*, *C. repandum*, *C. vernum album*. The *Cyclamens* are very lovely planted in groups, sheltered and shaded by rocks, and left undisturbed. *Yucca accuminata*, *Y. angustifolia*, *Y. filamentosa*, *Y. recurva*, *Y. gloriosa*, *Y. rupicola*. The *Yuccas* are indispensable for the rockery, their effect being so striking growing on the top or out of the side of a mound amid low-growing plants, *Rosa rugosa*, *R. r. rosea*, *R. r. rubra*, *R. pyrenaica*.

There are many kinds of bulbs which would be at home on the rockery; they would much improve its appearance, and be calculated to inspire interest. Some of the *Clematis* and other creeping and climbing plants might be introduced with advantage; and no matter how well the site was prepared in the first instance, a time comes when exhaustion sets in, and it would be necessary to lift some of the plants and add manure, leaf-mould, and peat, to supply them with food in the place of that which they had dissipated. This may not be required perhaps for years, especially if top-dressings are given occasionally; but in order to keep the plants in full vigour removal will sometimes be necessary.

Trees and Shrubs for Rockery.—There is room on the smallest rockery for a low-growing tree or a trailing shrub. They give elevation and character to the place, and afford shade and shelter to the delicate species which are impatient of much sunshine. Weeping trees, such as the silver Weeping Birch, *Sophora japonica pendula*, etc., are very effective. The double-blossomed Gorse and the Brooms may be used with effect in clothing rugged banks and mounds. *Rhododendrons*, *Azaleas*, *Kalmias*, *Ledums*, and other American shrubs may be grouped about or near to the rockery if space can be found and the soil happens to be suitable or

can be made so ; and amid these groups of Americans might be planted the Californian and other Lilies, not forgetting *Auratum*, which flourishes well among low-growing shrubs, these affording just the conditions as to shelter that the Lilies require. A few of the Biotas and other low-growing conifers will add to the appearance of the rockery, and colour may be given by using some of the many species which have gold and silver hues upon their foliage. The berry-bearing plants will appropriately find a home among the alpine ; the Mountain Ash, some of the Aucubas, the *Pernettyas*, *Skimmias*, and the small *Euonymus*, which bear berries so freely, will add warmth and colour at a time when flowers are scarce. Some of the recently introduced Japanese Maples, with their elegantly-cut foliage, will give character to the fernery. The *Aralias* and some of the graceful-habited *Sumachs* might be added. In elevated positions, where the natural soil is of a stony or rocky character, it is better in designing the garden to take a hint from Nature, and plant those things only which the place is naturally adapted to support with the best advantage. This idea will refer to many places near the sea coast, or in mountainous or hilly districts everywhere. We all know how charming variety is ; but amid a scene beautified by alpine shrubs and flowers, with climbing and creeping plants draping bare surfaces of cliff or bank, and Ferns in endless variety in the shady nooks and corners, there should be no wearisome monotony. On the contrary, all will be bright and fresh amid the ever-changing progress of plant growth. In my view such a spot, arranged in a simple, natural manner, is capable of affording a great deal of pleasure without causing much outlay in the first instance or afterwards.

CHAPTER V

Seaside Planting.—In seaside gardening the first and most important thing is shelter from the force of the fierce sea blast, and fortunately there are trees and shrubs in sufficient numbers for all purposes. The experienced planter finds no difficulty in making a selection for any position he may be called upon to plant. The first thing to be done is thoroughly to prepare the site by trenching and deepening the soil. It often happens that in such positions the soil is shallow and inferior, and, if possible, this should be deepened and improved. In making alterations it may be possible, by a little variation of surface, to deepen the side of the garden that is most exposed, or to raise a mound against the wind. When this

can be done, the creation of shelter will be a comparatively easy task.

Assuming that on the side from whence the cold wind comes we have raised a mound having an easy natural outline, on the outer edge plant a deep band of the common Gorse, next might come a mixture of the Wych Elm and the Austrian Pine. The Elms should be pruned, so as to make them dense of habit; and as they grow, both the Elms and the Pines will require thinning, as thick planting in exposed places is necessary at first to keep out the wind; but if the plants are allowed to injure each other by stealing each other's light and air, the planter's object will be frustrated. Those having charge of plantations of trees and shrubs have need of constant watchfulness, and especially is this the case in planting for shelter. Having created a long belt or wall of shrubs and trees, many things may be placed inside it the planting of which would have been useless before the shelter had been raised. Nearly all the common and many of the choice things may be planted by the seaside if well sheltered by first planting a substantial belt or mound of proved hardy shrubs. Hollies, Ivies, Boxes, Barberries, Laurustines, Arbutus, Aucubas, Magnolias, Escallonias, Euonymus, Evergreen Oaks, Japanese Privets, Tamarisk, and Laurels may be safely planted. The Cedar of Lebanon, the silver Mount Atlas Cedar, and many of the smaller conifers, may occupy sheltered positions.

The Chilian Pine (*Araucaria imbricata*) only feels really at home in the maritime districts, and the Wellingtonia usually thrives better by the seaside than in the midlands. All the Cypresses, but specially *Cupressus macrocarpa*, may be planted. Among deciduous things a very large selection might be made. The Alders, Barberries, Thorns, Laburnums, Dogwoods, Deutzias, Lilacs, Spindle Trees (*Euonymus*), and on the south and west coasts the Hydrangeas, grow to a large size and flower abundantly. *Leycesteria formosa* does well near the sea, and the Syringa or Mock Orange, the Magnolias, the Sumachs, Ribes, and the Robinias or Acacias, thrive in the sea air—only the wind breaks and splinters the branches of the latter so badly in consequence of their brittle nature. Many of the Spireas will succeed, and the Elders, including the variegated varieties, may stand in the front rank. In sheltered nooks by the seaside many things will grow better and with greater luxuriance than inland, in consequence of the greater mildness of climate near to a body of water that never freezes. A short time ago, when at Hastings, I saw a house within a few yards of the sea covered completely with *Magnolia grandiflora* in the rudest health; another only a few yards away was

covered with blue Passion flowers; and with good shelter from the winds seaside gardening becomes comparatively easy. But if living shelters must be raised, that work should be done, if possible, several years in advance of the general planting; and I would strongly urge the necessity of a thorough preparation of the site to create depth of soil, and a free use of the knife for a few years after planting, to thicken the growth and keep out the wind.

Decorating the Lawn.—It is only of late years that the phrase “gardening on the grass” has come into use, but the principle advocated is not unknown; in fact, it has been practised with the happiest results in many places in retired parts of the country. Probably centuries ago people with artistic ideas and feelings conceived the idea of allowing the lawn and shrubbery to meet and blend without any harsh dividing lines. The grass was permitted to grow up to the stems of the shrubs, and hide all the bare earth between them with a bright green carpet. Then came the want of a little colour to impart life to the masses of green, and so great clusters of Daffodils were planted on the grass in front on the salient points and angles. Other things, such as Pæonies, Fuchsias, Roses, etc., naturally followed; so the idea grew, and it was a most excellent one. We might easily conceive that with the spread of Schools of Art this kind of decoration should be still further developed; but it is not new—indeed few things are.

A short time ago I was looking round an old garden of the by-gone times, where gardening on the grass had been practised at least more than fifty years ago. The place has been unoccupied for many years, so the modern bedding-out gardener has been kept out; and though the grounds are in a rough unkempt condition, yet in the spring time the Snowdrops and Daffodils forming great clusters, and the old China Roses standing about in irregular patches, are a glorious sight, and are in fact the only redeeming features of the place, because they are the only things which seem to have benefited by neglect. To dispose these groups tastefully requires much thought, as when patches of colour are strewn too liberally the effect sought may not be obtained through being overdone. Picturesque grouping accords best with this kind of decoration, rather than formality or a striving after symmetry; and the background of shrubs, their height and breadth, with the extent of the lawn, must all be taken into consideration in the arrangement of these groups of flowers on the grass, so that all may blend and harmonise together. Snowdrops may be dibbled in the turf; and the Golden Primrose and the Wood Anemone may occupy positions amid the shrubs. And what a chance is here offered for making

an effective display amid the shrubs of the many beautiful Lilies from California and elsewhere! The Lily of the Valley may also be utilised to form a carpet in the subdued light of the spaces between the trees and shrubs just within the margins. Some of the strong-growing hardy Ferns may be grouped in the nooks and corners, and the Celandine Tree (*Bocconia cordata*), the Giant Knotweed (*Polygonum cuspidatum*), and other plants of stately habit, may find suitable positions for displaying their noble proportions. The Pampas and other Grasses, and in sheltered nooks some of the ornamental Bamboos, may be planted for creating variety of foliage. This phase of gardening is calculated to give much pleasure to all thinking people, because it opens up such a field for change and variety—not only in the disposition of the plants, but also in the treatment of the surface of the ground, by creating artificial undulations, taking advantage of the hillocks and hollows for planting those things which by their habit of growth produce an enhanced effect in such positions.

Sweet-scented Flowers.—The idea of a garden of sweet-scented flowers is an old one, but it is none the worse for being old; and those of my readers who have followed me thus far in this work will have discovered that one of my anxieties is to provide or suggest an opening for the employment in gardening of every order of mind. Though glare and glitter has until lately so much abounded, there are nevertheless plenty of materials for furnishing gardens to suit those whose tastes are quiet and refined. The garden of sweet-scented flowers should not be of formal design, as many of the sweetest flowers, such as the Honeysuckle, the Jasmine, the Virgin's Bower, and the Rose, do not show forth all their beauty when restricted and confined.

The climbing plants should have arches to clothe, and poles or pillars or the stems of trees to climb up. We do not all admire the same flowers, and the fragrance of some flowers is too powerful for delicately-nerved people; but there are so many things to select from, that all may be suited. The garden of scented flowers may be only a small plot in a back yard, or the particular feature in a grand garden many acres in extent; it may include trees and shrubs, or be confined to the lowliest flowers, such as Musk, Mignonette, and Pinks; but in every phase of it there will be room for climbing plants. The following list includes most of the best-known fragrant flowers that are well adapted for open-air culture:—

Trees and shrubs will include the Limes, Thorns, Laburnums, flowering Almonds, Barberries, Magnolias, Double Cherries, Portugal Laurels, Japanese Privets, flowering Currants, Azaleas,

Rhododendrons, double-blossomed Furze, Lilacs, Philadelphus (Mock Orange), Brooms, Spiræas, Sweet Briars, Kalmias, Daphnes, Sweet Bay, Cistus, Laurustines, Honeysuckles, Roses (especially the old-fashioned Roses, such as the Provence, Bour-sault, etc.), Jasmines, Wistaria sinensis, and Chimonanthes fragrans.

Among the hardy flowers which all should plant are the following:—Lavender in great clumps, Rosemary, Hyssop, Southernwood, Carnations, Picotees and Pinks, Sweet Sultans, Sweet Scabious, Musk, Mignonette, Stocks, and Wallflowers, including the Night-scented Stock. Sweet Peas in abundance should be planted in succession—that is to say, early in the spring and again in April; on warm soils Sweet Peas may with advantage be planted in autumn. Sweet Alyssum, Lilies of various kinds, not forgetting the old white Candidum, Hyacinths (including the Musk-scented Hyacinths), Narcissus, Lily of the Valley (*Dictamnus fraxinella*), Snowdrops, Violets, Water Lilies (if a place can be made for them) should have a home in the garden of sweet-scented flowers, as should also the Water Hawthorn (*Aponogeton distachyon*); the Mints and Thymes, and Tussilago fragrans (Winter Heliotrope) should also be planted in large patches. There are many exotics which can be planted early in summer, such as the Heliotrope, the sweet-scented Pelargonium, the Verbena, etc. As regards their arrangement some things look best in mixture, and others in separate groups. Musk and Mignonette form a nice groundwork to taller-growing plants, such as Roses. In old-fashioned gardens Musk is often found filling out-of-the-way corners where it is not often disturbed, and very sweet and nice it is to come all at once upon a patch of Musk and Provence Roses about the end of June on a bright sunny morning. Carnations and Pinks may occur in good-sized patches, as the foliage in a mass has a nice effect in winter. The preparation of the beds and borders must be well attended to before planting, and then with an annual top-dressing many of the plants may remain undisturbed for years. The garden of fragrance will not be costly to keep. Weeds must of course be kept down, and the surface be stirred frequently with the hoe. Patches of annuals and biennials may be sown at any time to fill up any vacancies that may occur. People who have not much time for gardening will find this kind of garden suit them better than if arranged more elaborately.

Winter Arrangements and Effects.—A house nestling amid trees! How pleasantly it sounds, and how pretty the effect either in summer or winter! The trees, of course, need not touch

or overshadow the buildings, as they generate damp in our climate; and somehow modern builders, in their efforts to create stylish-looking structures, frequently fail to keep out damp. In seeking for winter effects, evergreens are sure to be largely employed, but they should not monopolise all our attention, for there is a charm about a leafless tree that evergreens cannot furnish. I like to stand under the spreading boughs of the old forest trees in winter and look up into the sky through the branches: how beautiful they are on a frosty morning when covered with white rime! Walking across a lawn in the evening, I have stood for a minute under the spreading boughs of a large Horse Chestnut. I have done this with all kinds of trees at all seasons, for there is a fascination in thus, as it were, being able to get behind the scenes. Every tree has its own individuality. The Horse Chestnut, with its drooping, densely-branched conical shape, towering towards the sky, is always and everywhere an object of interest; unfortunately nothing will live under it, so dense is the shade. The Beech is another delightful tree, yet when well developed, as I have seen it, it is a bad neighbour. The Lime has a light and elegant habit, so numerous and delicate are the twigs which form upon the branches. And let me ask, How is it that as a rule the Birch is so much neglected by planters? For winter or summer no tree can surpass it for lighting up the sombre effect of heavy masses of evergreens. The Plane is another tree that should become more common near a winter residence to give dignity and elevation to the lumpish groups of evergreens.

A group of Cedars or Hollies fits in well beside a fine old Plane, and Rhododendrons or Laurels associate well with the Birch. A winter residence should always have plenty of trees for shelter, and deciduous trees are as useful as evergreens for breaking up cold winds. The evergreens will for the most part be used to fill in the foregrounds, and partially the middle distance also, the Scotch and the Silver Firs mingling their dark foliage with the lighter shades of the deciduous trees for distant effect. On the sides of the hills where space can be found for considerable plantations of timber, a bold group of forest trees is always a great set-off to any place. I saw at Thorpe, near Norwich, a very happy instance of the way in which a wood-crowned hill had lent its charm to a number of villa residences standing near its margin. There is a grandeur about these forest giants which the evergreens for the most part cannot attain to.

Fruit-bearing Trees and Shrubs which ripen and retain their fruit in winter are indispensable in winter arrangements. There is much beauty in the arrangement of cones upon the Fir tribe,

and everybody is acquainted with the cheerful aspect of a group of Hollies when laden with berries. In the wild garden bold masses of the Dog Rose and the Sweet Brier have a brilliant effect when in fruit. To come to smaller fruiting plants, we have the Aucuba, Cotoneaster, Pernettya, Skimmia, and Ivies in great variety. The Pyracantha and Coloneaster Simonsi grafted standard high are very effective foreground plants.

And neither need the winter be destitute of flowering subjects, the naked-flowered Jasmine, the Laurustine, Chimonanthes fragrans, the Box, and the Yew tree, flower in February, scattering clouds of pollen on a windy day. A group of the early-flowering Sallows or Willows might be appropriately used to give character to any retired spot where there is at present a dearth of interest, for the sake of the early catkins. Among the lowly-flowering plants can anything surpass the Christmas Rose? and few plants have so long a season. In sheltered places the early plants begin to blossom in November, and I have gathered a dozen flowers on 28th March, so that the Christmas Rose really forms a link between the autumn and the spring. Wallflowers and Primroses, Violets and Pansies are seldom flowerless in winter, and the Garden Anemone (coronaria) in many shades of colour will flower freely in winter on a dry border. I have elsewhere referred to the early and late flowering bulbs; the Sternbergia lutea, late in autumn, and winter Aconites and the Snowdrop and Crocus are really more of the winter than the spring. Much may be done to give warmth and cheerfulness to a place by the free use of plants having variegated foliage. Among these subjects the variegated Holly stands pre-eminent; then comes the Aucubas and the variegated conifers, of which there are many forms among the Cypress family, including the Japanese group. Golden Yews are effective; so are all the Biotas and Arborvitæ, especially Vervæneana among the latter. The bronze-leaved Cryptomeria elegans, which is also a Japanese species, is a very useful winter tree, and succeeds well as a small specimen for the villa garden in the suburbs. Much more might be said upon this subject, but I do not want to make these chapters unnecessarily long.

Transplanting Trees and Shrubs.—Before I leave this part of my subject I should like to say a few words upon the best time to plant. I have already referred elsewhere to the importance of a thorough preparation of the site. Whether the subject to be planted be a Primrose, or a Gooseberry bush, a common Laurel, a Cedar of Lebanon, or a forest tree, the same rule holds good. The working and deepening of the root-run will have an influence upon the life-history of the plant or tree; but in the

deepening of the bed of soil, or in the amelioration of its condition, no great amount of the bad subsoil should be brought to the surface, especially if the subsoil is clay or chalk. Sand is of less consequence, because it is not of such an unmanageable nature as clay, and chalk requires a long exposure before it will blend with anything; therefore, except in the smallest possible quantities, it should not be brought to the surface. Where the main staple is shallow, resting on a bad subsoil, it may be possible to make special situations during the formation of the grounds for choice subjects. In the construction of the roads and walks or other accessories, the good soil may be carted to any site where it may be required. As a case in point we will say we want to establish a group of Cedars in a situation where the soil is thin and the subsoil indifferent. Well, we cart spare soil from another place and elevate the Cedar mound a foot or so, and the difficulty, so far as their future is concerned, disappears. This is only acting on the principle of doing well what is worth doing at all, and if this system could always be acted on our difficulties would vanish, and failures become less and less frequent. Trees and shrubs that are frequently transplanted suffer less from removal than those which are seldom moved, for the reason that the treatment received by the plants causes a ball of fibry roots to be developed, instead of the few thick fleshy roots which a long residence in one position produces. This is why nurserymen are constantly transplanting their young stock, so that they may always be in a condition to remove with safety to any part of the country.

In a country possessing such a variety of soils the same treatment will not suit all alike, and experience alone can guide us aright. In some places evergreens may be moved at any time, if the work be done with care. I was visiting a noted place in Norfolk some time ago, and my attention was drawn to a full-grown Holly hedge that was moved the previous July without—so far as I could see—suffering any injury. The soil was of a light, sandy nature, and closed in over the roots, fixing them firmly in their situation immediately. I know places in Surrey where the soil is of a soft, silky texture, containing a good deal of vegetable matter, marked by an absence of lime, and Rhododendrons and other evergreens can be moved successfully at any time. But it would be unwise to assume from these instances that the same thing could be done everywhere, and this is why personal experience of a locality is so valuable in conducting planting operations of any magnitude. As a rule, it is never wise to obtain plants from a good soil to plant on an inferior one; but the opposite course is always safe. In difficult situations, where the work

has to be done by unskilful hands, from the middle of September to the end of October is the best time to move evergreens. The next best time is from the first of April to the middle of May. Frequently in careful hands the spring planting is a great success; but there are little details in the after-management which enable the thoughtful planter to counteract vicissitudes of season, and these are mulching over the roots, occasionally shading in the case of rare or choice specimens, and sprinkling the foliage to check evaporation during a dry time until the roots get into active work.

In moving plants from a sheltered place to an exposed one great care is necessary, and a shelter of some kind for the first season indispensable. In dealing with some soils, balls to the plants shifted must, as far as possible, be secured of considerable size. In others it is more important to secure plenty of unmutilated roots than a ton or two of earth attached; hence the importance, as I said before, of studying each locality separately and on its own merits, as it does not necessarily follow that because any particular line of action has been attended with success in one place the same result will be obtained in all others. Usually the reason why one person succeeds and another fails in similar operations must be sought for in the personal character of the man. Merely sticking in a tree or a shrub is not enough to secure success—in fact does not deserve it; and, as a rule, all men meet with the success they merit in the long run. All newly-planted trees must be secured from the effects of wind, either by placing a strong stake near and tying the main stem to it, wrapping a piece of old sack or something soft round the stem to guard it from injury by abrasion; or drive three stumps in the ground at equal distances round the tree, and, 5 or 6 feet from it, fix a padded ring loosely round the main stem at the right elevation, and attach three wires to the ring, and strain them to the stumps.

CHAPTER VI

Propagation of Trees and Shrubs.—If the heading I have taken for this chapter was fully worked out and amplified there would be matter enough for a good-sized treatise, but all I am aiming at is to show amateurs how they may, if they wish, propagate in a small way the trees and shrubs which form the framework of their gardens and grounds. The proper time to take

Cuttings of trees and shrubs is in autumn, beginning with the

evergreens early in September, and the deciduous things as soon as the leaves fall. First as to the evergreens. All the Coniferæ, such as the Cypress, Biota, Thujopsis, Arborvitæ, Yew Tree, etc., should be planted under glass, and during the early stages must be kept close. A cloche or bell-glass will do when only half a dozen cuttings are required, increasing the area according to the number. It is best to raise a mound of prepared compost in which sandy loam and leaf-mould are blended together, with half an inch of clean sand on the top. Make it firm; if dry, water; then mark the size of the glass by pressing it down, and dibble in the cuttings, fastening them by pressing the soil round them. Water with a rosed pot, and when the damp condition has passed away put on the glass. The glass should either occupy a shaded position, or else a shade should be employed. When possible the cuttings should be taken off with a heel of old wood, and should be from 5 inches to 8 inches long. They do not involve much labour—just a look occasionally to see that the soil is moist enough to keep the sap fresh that is in motion at the base of the cuttings.

In the case of the resin-bearing trees the work of healing the wounds and covering them with granulated matter, from which in time roots will issue, is a slow process; but still it is performed with regularity, and but few failures occur. All we have to do is to keep the cuttings just moist and in a close confined atmosphere, to keep the foliage fresh and active till the young rootlets begin to work, then more moisture will be required, and a little ventilation as soon as top-growth begins, till by and by the glasses can be taken off altogether; and in course of time the young plants should be transplanted to the reserve garden to prepare them for the lawn or shrubbery. All the choice kinds of evergreens, such as the Aucubas, Arbutus, Berberis, Euonymus, Coton-easter, Escallonia, etc., will strike well under a glass-light or frame in a shady position. The common things, such as Laurels, Privets, etc., may be planted in rows in the open ground, with just a little litter scattered among them in frosty weather. Boxes strike very well in the open, also in a partially-shaded position on the west side of a wall or fence. In all cases the heel of old wood will expedite the formation of roots; and it is most important that the cuttings be taken from their parents and be trimmed early in autumn. If this be done, they may afterwards be laid in thickly in a shady border and replanted later on. As the work of forming the callus will be in active operation only of course when finally planted, no more exposure must take place than is absolutely necessary. The cuttings of deciduous trees and shrubs

should be taken as soon as the leaves fall, be cut to the required length (from 6 inches to 8 inches), and laid in a cool, shady border, and be finally planted out as opportunity offers.

In planting the cuttings, only a small portion may appear above ground. A single bud will be sufficient, as the more there is exposed to the drying influence of the atmosphere the greater will be the evaporation, and the difficulty of keeping a branch of a tree alive exposed to drying winds will be great; but if the cuttings are inserted in the earth nearly full length, and if, in addition, when a difficult time comes of dry, frosty winds in March, a thin mulching of dry litter or partially decayed leaves be employed, the cuttings will be perfectly safe, and the formation of roots will proceed quietly and surely.

Layering.—Very many trees and shrubs (in fact most of them) will form roots if the shoots are simply bent down and firmly secured in the soil at the base of the plants; but the rooting is facilitated and hastened by notching or splitting the stem that is brought down to be layered about the centre of the part buried in the earth. The whole process is a very simple one. In the nursery the stools from which the layers are taken are thinly planted, leaving space all round their circumference to peg down the young shoots which are annually thrown up. Thus the shoots grown this year will be layered some time before growth begins, and a new forest of young shoots will spring up from the old stool when those of the previous year are pegged down; and so it goes on year after year—one set of shoots are pegged down, forming roots, to be severed from the parents as soon as that is accomplished, another set is growing up to be operated on in the following year. But where only a few plants are required—for instance, say we have a choice *Rhododendron*, and we want a young plant of it—a young shoot may be bent down to the ground; have a notch half through the stem cut in the lower side—the upper side will do if more convenient, or a slit will answer as well—cutting upwards half through the stem, and then peg the shoot down, burying the wounded part 3 inches or 4 inches in the ground, making all firm. Nearly everything will root from cuttings, and layers are even more certain than cuttings, because the connection with the parent is continued till the roots are formed.

Grafting is a more expeditious way of increasing choice shrubs and trees than layering. All the choice variegated *Hollies* are grafted upon the common green variety. All the choice named varieties of *Rhododendrons* are grafted, and so are many of the conifers; but no useful purpose would be answered by going fully into this subject here, as a propagating house, or at least a close

pit, will be required for carrying it out successfully, even if only done in a small way for experiment. Grafting is simply uniting two separate individuals together, and these must not only be in a fit condition as regards age and size for the union, but the manipulating must be carefully done with a keen-edged implement so as to fit exactly. Probably no great amount of skill may be required to cut two branches of suitable size to fit and bring together as large a surface of the inner bark of each individual as possible, and on this lies the chance of a successful operation, assuming that the two plants are suitably matched; but experience (practical knowledge) tells in this as in all other work we are called upon to perform. Something depends on tying the graft to the stock with requisite but not unnecessary firmness, and the application of clay or wax to keep out air from the wounded parts, so that the sap may flow freely; in fact, every operation connected with grafting is important. There are many ways of grafting for young stocks. Whip grafting is the simplest and best, and it consists in heading down the stock, cutting a thick slice from one side, and treating the scion in a corresponding manner to make a perfect fit. Cleft or crown grafting is better adapted for larger subjects, and in-arching can only be practised when the subjects to be united are growing side by side, or can be brought near to each other.

Budding is an excellent mode of propagation, and is largely employed in the propagation of deciduous trees, such as Thorns, Roses, etc. Having occasion to refer to it fully when treating of the Rose, I shall say no more about it here. This description of the propagation of trees and shrubs will hardly be complete without a few words regarding the sowing of seeds; as, though it may not be necessary in a small way to raise such things from seeds, yet in a condensed form the knowledge is worth having, as friends from foreign countries are continually sending or bringing home seeds of conifers or other choice trees and shrubs. Seeds of conifers and American plants are best sown thinly in pans of peat and sand placed in a darkened frame. A little artificial heat, if very slight, is not objectionable. The darkened frame enables us to keep the soil in which the seeds are placed at an even state of moisture without using the waterpot much, and some source of danger is removed. Light, of course, must be admitted as soon as germination takes place.

Seeds of forest trees may be sown in drills in the open air. Haws and Holly berries are buried in moist sand for a season to soften their outer covering, and are then sown either in drills or broadcast on beds, covering with the soil from the alleys.

CHAPTER VII

THE NATURAL GARDEN

A VILLA garden laid out in the natural style may be small or comparatively large, according to the means of the owner. If large, it will probably comprise several distinct features ; but for the present I will assume that it does not altogether exceed an acre. The house and offices will probably be situated near the centre, with the best rooms facing the south, overlooking that part devoted to flowers and shrubs, with the vegetable garden in the rear—that is the usual way of placing villas of the character I have now in my mind. Instead of laying out the ground in the usual way with geometrical figures and formal paths and edgings, we will adopt a different course, which will possess the advantage of always looking neat without much labour, and at the same time always contain something worthy of admiration. The first thing to see done is to make the soil as good as possible, and deepen it by digging and trenching, taking notice of its character as we go on, so as to select suitable furniture ; for we must recognise the fact that some plants are fastidious in the matter of food, and unless healthy and flourishing they cannot yield satisfaction.

The paths must be well constructed of sound materials, so as to be dry and comfortable to walk upon in all weathers, and the main path—which leads, it may be, from the public road to the house—must make manifest its utility by trending in an easy, natural manner to the door without any ungraceful windings or twistings for increasing the apparent extent of the grounds. In a garden of this character the paths should be in accordance with the main idea of the place—that is, the main path and its utility as an approach must be apparent without any attempt at deception ; but more freedom of treatment may be allowed in all the smaller pathways, although of course, even in their case, that fitness of things to which I have elsewhere alluded must never be lost sight of. But with this proviso they may meander about from point to point, taking in at every turn some object of interest—a choice shrub or rare plant, it may be, which requires a near view in order to realise and enjoy its beauties to the fullest extent. As this garden when once planted is not to cost much in keeping, there will of course be no

Lawn, in the ordinary sense of the word, but Ivy may be used to cover any open place immediately under the windows, to

form a pleasant green spot for the eye to rest upon. If the garden adjoins the public road, it may be wholly or partially hid by a belt or group of shrubs or low-growing trees, though I think the feeling which prompts Englishmen to isolate themselves is not one to be encouraged, for, as a rule, it adds to our pleasures if we permit others to share them; and if we allow the passers-by to get a glimpse of the scenes of beauty we have created, it may perhaps benefit them without injuring ourselves. Therefore, in

Planting the blinds, leave a thin place here and there to open a vista through, and let in a stream of light. If the surface of the ground was originally level, mounds may be thrown up in suitable places to form sloping banks for choice alpine or Ferns. The shrubs admitted inside the blinds should be of a choice character, of slow rather than rapid growth, as these are usually the most valuable. Places will probably be found for a rosy-cheeked Apple or a good free-bearing Pear; a Quince or a Mulberry will not be out of place in certain positions, to give character to particular spots. Weeping trees, such as the Ash or silver-barked Birch, may appropriately be placed at the junction of two paths, to take off the bareness, and may perhaps shelter a rustic seat. Hollies of various kinds may occupy prominent positions, as they are always beautiful, and never more so than when loaded with berries in winter. The large family of Ivies will supply many species both of the climbing as well as of the erect or arboreal forms.

Rhododendrons, Azaleas, and Kalmias, if the soil is suitable, may mingle on the verge or outline, or perhaps be gathered in a group, out of which may spring in the summer time some of the beautiful Californian and Japanese Lilies.

It is one of the great advantages of this kind of gardening that we may have so much variety. Arches for creepers will form special features at the entrance to any of the nooks or corners where any special favourites may be located. The hardy Heaths may grow in wide-spreading masses, either amid the gentle undulations or on the elevated points. The common species will grow everywhere in light, sandy soil. Lavender and Rosemary in large bushes, and the Rose in many forms, may be present, not forgetting the Sweet Briers, Honeysuckles, Jasmines, and Clematis in great clusters, tied to poles or trained to rustic arches, or clothing the naked stems of trees and shrubs; the flowering Almond, the Forsythia, the Barberries, and Daphnes, including the early fragrant Mezereum, which has so gay an appearance in spring, followed later on by the brightest of scarlet berries. The Lilacs, the Guelder Rose, and the Syringa or Mock Orange

should be planted amid the background for the sake of their sweetness and beauty in spring, and the Laburnum for its long, dangling chains of gold. And what an opening there is for bulbs among the Ivies and other low-growing plants, which can be used for filling up every spare corner! for it is one of the features of the natural garden that there are no bare places. Plants will grow up in spring and flower, the foliage ripen and die down in its season, and forthwith others spring up to fill their places. There will be no edgings to the paths—that is, no formal edgings, such as turf or Box; but low-growing, wide-spreading plants, as the Arabis, Aubrietias, Saxifrages, Sedums, dwarf Phloxes, Pinks, and a host of other dwarf hardy things, may be planted in irregular masses to form the outlines and fronts of the borders, and fill up anywhere. If any of them grow too far, so as to encroach on the path—which in all probability they will—they can easily be cut away with the spade. Places can be found for Pæonies, Crown Imperials, Alstroemerias, and many other bulbs which dislike being disturbed. Then

The Winter Aspect will be very agreeable and interesting. The different tints of foliage of the low masses which hug the ground are of a striking character, and may be contrasted with some of the silver and golden-foliaged conifers, and the warmer tints of the variegated Holly and Aucuba. Standard bushes of Pyracantha and Cotoneaster laden with bright berries in winter brighten up everything immensely, and the Skimmias and Per-nettyas are at home on the mounds. With a place well and fully planted there is no room for weeds; and if the preparation of the site has been thorough at the first, there can be no pressing necessity for much heavy labour for a number of years. And the jobbing gardener, with that propensity, so deeply ingrained in his nature, to dig up and cut off what comes in his way, may be given a wide berth. Top-dressings of rich soil can be given to those things that seem to require it.

If a strong plant seems disposed to grow over or overshadow a weakly one, it should be at once curtailed. But a system of grouping should be adopted, whereby all weakly delicate plants can be planted by themselves on a raised bed or a mound of rockwork immediately under the eye, and not likely to be forgotten. In spring, vacant places can be filled with hardy annuals that will establish themselves and scatter their seeds and come at their season without any trouble of annual sowing. Among these are the Virginian Stocks, the Forget-me-nots, Candytufts, branching Larkspurs, and others. Not the least beautiful and interesting plant that will take care of itself in this way is the old biennial Honesty,

which comes so early in spring. Some of the many beautiful forms of *Violas*, if frequently top-dressed with soil and manure, and the young shoots afterwards pegged down into it, would be exceedingly bright. The chief work and attention required will be of a light character, such as regulating the growth, cutting off dead flowers and seeds, which any lady might do who really cares for flowers. The positions for the *Roses* will require special preparatory treatment, and, if needed in dry weather, should have liquid manure given them. In the case of any choice single plant a *Seakale* pot or a large drain pipe may be sunk in the ground, filled with good soil, and the plant carefully planted therein. In this way the roots of strong-growing plants will be kept out. This idea may be worked to any extent in summer decoration. If at any time a little more colour was needed in any particular spot, *Fuchsias* or *Geraniums* may be dropped in among a group of plants whose beauty had departed, and when the need for their presence passed away they could be removed. This plan of gardening is calculated to give an immense amount of pleasure at a comparatively small cost; for it is the incessant annual drain upon the purse which to the person of limited income seems so heavy.

CHAPTER VIII

Arranging the Spring Garden.—Many of the most beautiful spring flowers do not seem to associate well with formal beds in a formal garden. One of the best arrangements of spring flowers I know of is at *Belvoir Castle*. In their grouping *Mr. Ingram* has been very happy in taking advantage of the positions Nature has there so lavishly placed at his disposal—a magnificent extent of surface, embracing every aspect at varying elevations, wood-crowned hill and shelving sunny banks, with open glades sheltered from the fierce currents which in March devastate the tender foliage and budding flowers. In such positions groups and borders of all the tints of spring can be formed in the most effective manner both for contrast and for harmony. The bright early flowers of the year, the *Aconites*, can have a sheltered shelving bank (what a sight a broad mass is when in blossom!) I know several places where they are largely grown, and which in January are one of the sights of the neighbourhood. And all this gorgeous beauty can be enjoyed for a small expense. All we want is a dry bank, not too densely overgrown. Dibble the bulbs in thickly, and leave them for ever undisturbed. The various forms

of the Wood Anemone, planted where they can stand some time and form broad irregularly-shaped masses, are very effective.

The Primrose is more at home in a semi-wild condition than when planted in the beds or borders. How beautiful Snowdrops and Lent Lilies (Daffodils) are when springing out of the ground in great clusters in some grassy nook against a background of shrubs! Honesty (*Lunaria biennis*) is most effective in a scattered kind of group on one of the elevations in undulating ground where one can meet it unawares on turning a corner. The Lily of the Valley could be used in the same way—only in its native home it thrives best under a thin shade amid decaying leaves and vegetable matter, which are probably the accumulations of centuries. There are, of course, many spring flowers which will come into the beds and borders properly so called; but how interesting it will be if, in designing the spring gardens, we can arrange, amid the shrub and tree-growth forming its margin, informal groups of the plants I have named, and others which a little study will bring to light. Can anything be more beautiful than our hardy native heath *Erica carnea*? In sandy soil it will spread out into a broad mass that is exceedingly effective. The Wallflowers require but little care in their culture. But it must be borne in mind that before anything which is expected to have any degree of permanence is planted, the ground should be well prepared, for even our native plants pay in increased beauty for good treatment. Besides these permanent features to which I have briefly adverted, there are spring-flowering trees and shrubs in great variety—the Almonds and Cherries, for instance; the latter—bearing, in some cases, double flowers—are beautiful in spring. Then there are the Barberries in variety, whilst the Lilacs, flowering Currants (*Ribes*), the Forsythia, *Kerria japonica*, the Golden Chain (*Laburnums*), and the Thorns, which herald in the summer, are unapproached by anything which comes after.

Among other families of plants which require more attention, and are well adapted for planting in the borders anywhere, may be named the Alyssums, Arabis, Crocus, Cyclamen, Corydalis, *Doronicum*, *Erythronium* (Dog's-tooth Violet), *Dicentra* (Fumitory), Gentians, *Iris reticulata*, and others. *Iberis* (perennial Candytufts) are very showy in spring in any position. I saw recently a great spreading mass of *Iberis correifolia* growing on a mound, which was quite the feature of the place. The Hepaticas are a very beautiful family, not nearly so much cared for as they deserve. Somewhat frequent division suits them best. The Alpines, Phloxes, the Scillas, the Forget-me-nots, the Tulips, and Fritillarias with the Narcissi, would alone, if only a fraction of

the variety they yielded were gathered up, make a most gay and interesting garden, and I have only glanced at the real wealth which the spring offers. The Pansies or Violas are a host in themselves. It is rather difficult to tell where the Pansy ends and the Violet begins, but one can hardly go astray in planting a good selection of both. These, too, are adapted for filling formal beds in the parterre, where such exist, their propagation is so easy and inexpensive; cuttings root freely in a shady border at almost any season of the year, and the roots can be divided in spring or autumn. Seeds also are produced freely, and soon germinate in moist sandy soil. I have seen a border planted with Pansies, and they are always in flower. They scatter their seeds, and young plants spring up in great numbers. Rather a moist situation suits Pansies best, though, if the land is deeply cultivated and plenty of manure buried for the roots to find when the hot weather comes, Pansies will grow anywhere. Top-dressings or mulchings are of great value, and if the long straggling shoots are pegged down, new roots are formed and the plants are rejuvenated in appearance.

The white, pink, and scarlet Daisies are indispensable for spring, and some of the newer varieties have large flowers on long stalks, which may be gathered for the room. In small glasses, mixed with suitable foliage, they have a pleasing effect, and for filling beds in association with other low-growing plants Daisies have but few rivals. A large stock may soon be obtained by division of the roots; the tiniest offset will break away with a bit of root attached and quickly make an independent flowering plant. Division may take place either in spring or autumn.

ANNUALS sown in August and transplanted in October or November will do much to brighten the garden in spring. Many of the annuals usually sown in spring will succeed better if sown in August; indeed, August is the natural month for seed sowing. It is then they ripen and fall to the ground. None of the plants raised in spring have the vigour and hardihood of those raised in autumn. Sow thinly on rather sandy land, and in transplanting leave plenty of space between, according to the species or variety. Then in spring, besides the soft tints of opening blossoms and the delicate green of expanding leafage, there are many coloured foliaged plants adapted for the spring garden whose colours for the first month or two of spring, before the sun gains its full power, possess a purity and brightness which are unknown later in the season. The variegated Arabis, the Golden-leaved Thyme, the Golden Lamium, the Golden Balm, and other plants with

golden or variegated foliage, lose their colour when spring merges into summer.

The Reserve Garden.—In small places this need not occupy much space, as a border in the kitchen garden will serve to raise seedlings and strike cuttings. It is always desirable to have a plot of ground set apart as a kind of nursery to sow such things as Wallflowers, Anemones, Delphiniums, Foxgloves, and dozens of others, of which it will be desirable to have young plants in the course of preparation. Many choice hardy plants may be raised from seeds, and though it may perhaps be better to sow the seeds of these in pans in a frame, yet, as soon as they will bear handling, a bed in the reserve garden till they gather strength to group in the border will be the best place for them. Cuttings that have been rooted under the handlights or frames may be allowed a time to get up strength. New things brought in from the nursery, which, as a rule, are small and often delicate when they arrive, should have their proper bed to recruit their health for a season, where they will be under the eye and not lost amid the crowd in the border. The experimentalist will require a reserve garden for many things. The choice seedlings of bulbs will there find a suitable home. Cuttings of choice trees or shrubs can be grown on till they are strong enough to plant out finally. The most convenient form for a reserve garden will be a square or oblong, and it should be laid out in parallel beds 5 feet or so wide, so that the little plants can be conveniently hoed amongst and cleaned. The alleys or paths between need not be more than 18 inches wide, just giving sufficient space to walk between and attend to the wants of the plants. Such beds need never be idle, as, if not required for growing on young stock, they can be planted with Pinks, Carnations, Pentstemons, Phloxes, Pyrethrums, etc., to produce flowers for cutting. In short, such a garden will always possess an interest of its own to any person who really loves flowers for their own sakes. One of the purposes of the reserve garden will be to receive the plants that have done their work in the spring garden. There the Daisies can be planted after division, the Aubrietias, Arabis, and Forget-me-nots can be pulled to pieces and started again on a new career.

CHAPTER IX

Hardy Bulbs.—The culture of hardy bulbs and rhizomatous plants is one of the most interesting phases of gardening. There is such an endless variety, and the colours of the flowers are un-

surpassed for beauty and magnificence. In the Lily, the Tulip, and the Iris will be found unrivalled examples of gorgeous colouring, that no painter's brush can approach for effectiveness. Many who take up gardening as a hobby concentrate their labour and attention upon one family. Some select the Rose, others the Carnation or the Tulip or *Ranunculus*. The Dahlia, the Hollyhock, and the *Chrysanthemum* all come in for their share of admiration, and have their votaries. But the garden of bulbs is better calculated to awaken interest of an absorbing character than most of the other families I have named, the Rose alone excepted. Concentration is, doubtless, the right course to adopt in all things where superiority is aimed at. To fritter away time upon many things leads to mediocrity in all. Besides, there is not the same love springing up in the heart for things we only casually see, and whose life-history or culture we only imperfectly understand. In bulb culture we have an endless round of flowers. In the beginning of the year the Aconites, the Snowdrops, the Cyclamens, and Anemones can be gathered amid the snow. Then comes the Crocus, the Narcissus, and Tulip, with still brighter and bolder masses of colour; the heavily-scented Hyacinth, the lowly but lovely Scilla; and then, as the days lengthen and the sun gathers up his forces, the Lilies burst out in all their stateliness and grandeur. With the approach of autumn comes the Gladiolus and Colchicums, finishing off amid the snows of winter again with the beautiful *Sternbergia lutea*. Besides these I have named, there are other families less well known but not less beautiful, which spread their flowering time over many months—the beautiful little *Chionodoxa lucike*, in spring, the Alliums, Brodiaeas, the Fritillarias, the Alstroemerias, and others which will be referred to in a list at the end of this article. A garden where bulbs form the chief feature cannot be surpassed in beauty and variety; but even such a garden should have other furniture, as a picture, however beautiful it may be, is not complete without a frame. The effect of the most beautiful flowers is enhanced by a foil of contrasting materials. This being granted, as I think it will be, the question arises in what way can we best arrange our bulb garden so as to make the place suitable for their growth, and at the same time bring out all their beauties? Nearly all the bulbs require shelter; for the most part their flowers are delicate and fragile, and often, as in the Lily, their heads of blossom are too heavy for their stems to bear without support, and if the winds catch hold of their broad, massive petals, it disfigures them sadly. A bed of Lilies exposed to the full force of the wind will seldom be in a presentable condition; but when planted amid a sheltering bed of

shrubs, the winds pass them by harmlessly. The bulb garden should have its main features outlined with trees and shrubs, and in their arrangement groups of the smaller flowering shrubs should advance in a scattered or skirmishing order to the centre of the garden. Rhododendrons and Azaleas make good nurses for Lilies. Open beds in sheltered sites could be prepared for the *Gladiolus*, the *Iris*, and the *Tulip*. Crocuses and Snowdrops might spring from a base of creeping growth. Those things that dislike removal, such as the *Alstroemerias* and *Crown Imperials*, could have their wants cared for. A man with but little leisure may find more pleasure in a garden like the one I have feebly attempted to describe than in any other, and one of the advantages of it is, that it can be any size we like—half an acre or more, or only a rod or two in extent. There will be always something to expect, something to watch for ; and this feeling of expectation, this anticipation of the visit of old friends, forms a charm of a most interesting kind. The ground must be well prepared by deep culture, and should be well drained. The best result will be obtained in a sandy loam, adding leaf-mould or peat to meet special wants. The different families can be grouped together in irregular masses ; occasionally broad patches of some low-growing plant, such as *Alpine Phloxes*, perennial *Candytufts*, *Pinks*, etc., may intervene, as a garden full of bulbs (of *Lilies*, for instance) would at times be too overpowering without some other plants to tone it down. In a well-drained sandy loam most of the bulb families will keep better in the ground. When they become too crowded they must be taken up and divided ; but with few exceptions they may be replanted again immediately. All *Lilies*, for instance, lose strength if kept long out of the ground. Florists' *Tulips*, or any other named section of bulbs, such as the *Gladiolus*, should be taken up to have the beds prepared and remade, and to secure the young spawn. But for the greater part of the bulbs grown in the beds and borders, annual disturbance is an evil which should be avoided as much as possible. Cocoa-fibre is an excellent mulching for beds or patches of choice bulbs, and as it decays it amalgamates with the soil and improves its character. In planting anything of a new or rare character, place a spadeful of compost round the roots. It is always a good plan to keep a heap of rich, light, sandy soil laid by in a corner for this purpose. Little thoughtful acts of this kind often make the difference between success and failure. It often happens that a plant arrives from a journey in a weakened, exhausted condition, and if planted carelessly, or even with ordinary care, in the natural soil, it might die ; but if placed amid nice, dry, sweet, healthy compost, it revives at once, and a good start is half the battle.

List of Hardy Bulbs.—*Acis* (*Leucojum*) *autumnalis*, *Allium azureum*, *A. fragrans*, *A. ciliatum*, *A. Moly*, *Amaryllis Belladonna*, *Brodiaea coccinea*, *B. grandiflora*, *Bulbocodium vernum*, *Calliprora lutea*, *Colchicum* (Meadow Saffron or Autumn Crocus). All these are very beautiful, both single and double. They are most effective when coming through some thinly-growing plant—a *Sedum*, for instance. *Crinum capense*, *Crocasmia aurea*, *Crocus*—many kinds besides those usually imported from Holland—should be collected together in such a garden. The Lady's Slipper plant, from North America, *Cypripedium spectabile* and *guttatum*, not forgetting our own native species, *C. Calceolus*. The Slipper plants should be planted in peat in a cool, partially-shaded bed or border. Just within the edge of a bed of *Rhododendrons* would suit them. *Epipactis palustris*, *Erythronium americanum*, *E. Dens-canis* (Dog's-tooth Violet), are very pretty, both foliage and flowers; plant in peat or sandy loam and leaf-mould. *Fritillaria imperialis* (Crown imperial), *F. Meleagris*, and others; *Galanthus nivalis* (Snowdrops), *G. plicatus* (Crimean Snowdrop), *Gladioli*—may be had in great variety, the early-flowering kinds beginning to blossom in May, and the late (*Brenchleyensis*) finishing off the season in September, or later if not planted too early. I have had beds of *Brenchleyensis* in good condition in October that were planted in May. *Hyacinthus amethystinus*, *H. orientalis*, *H. candicans*. The Grape and Musk Hyacinths should be included, and as many of the imported Dutch varieties as means and space will allow. Under careful management, planting in well-prepared beds, very good spikes can be obtained from English-grown bulbs. *Narcissi* in many kinds, including *N. bicolor*, *bulbocodium*, *Jonquilla maximus*, *juncifolius minor*, *poeticus*, *odorus*, and *triandrus*; *Ophrys apifera*, and *O. scolopax*—plant in peat and loam mixed with crushed limestone. *Orchis foliosa*, *O. latifolia*, *O. maculata*, *O. nigra*, *O. papilionacea*—the two last named genera are orchidaceous plants, and should be planted in slight shade. The *Orchis* family delight in moisture; a bed of moist peat will grow them well. *Ornithogalum montanum*, *O. umbellatum* (Star of Bethlehem), *O. nutans*, *O. pyramidale*, *Panercatium illyricum*, *Scilla amoena*, *S. bifolia*, *S. campanulata*, *S. nutans*, *S. siberica*, *S. peruviana*. The *Scillas* are most beautiful dwarf spring-flowering bulbs, and should be planted 3 inches deep in light sandy soil. A mixture of leaf-mould and road-scrapings is a great help, where the soil is heavy, for these and many other kinds of bulbs. *Sternbergia lutea*, *Tigridia pavonia*, *Trillium grandiflorum* (Wood Lily), in shaded situations. *Triteleia uniflora*, *Tulipa sylvestris*, *T. viridiflora*, *T. turcica*, *T. cornuta*, *T. Clusiana*, *T. Gesneriana*, *Iris cristata*, *I. flavesces*, *I. florentina*,

I. germanica, *I. iberica*, *I. graminea*, *I. pallida*, *I. reticulata*, *I. Susiana*, *I. sambucina*, *Lilium candidum*, *L. auratum*, *L. bulbiferum*, *L. canadense*, *L. chalcedonicum*, *L. croceum*, *L. eximium*, *L. japonicum*, *L. speciosum*, *L. longiflorum*, *L. tenuifolium*, *L. tigrinum*, *L. venustum*, *L. Washingtonianum*. Though this list has grown to larger proportions than I intended, yet it is very imperfect, because many good things are omitted. The truth is, the bulbaceous plants are now in such immense numbers, that a life's study is required to become thoroughly acquainted with them all; and wherever there is a good soil, with the means of improving it where needful, and plenty of leisure, I know of no more pleasant subject to be taken up as a hobby than the culture of plants having bulbous roots.

CHAPTER X

THE AMERICAN GARDEN

MANY of the beautiful trees, shrubs, and flowering plants which adorn the tastefully arranged English garden have been brought from the higher regions of that great continent—America. In large gardens, where there is space for many separate and distinct features, the American garden may very appropriately find a niche somewhere—not, as too often happens, in the shape of formal beds of *Rhododendrons*, but treated freely and boldly, bringing into prominence not only picturesque groups of evergreens, but drawing freely upon the rich stores of deciduous trees and shrubs, using freely, too, the Lilies and other flowering plants which associate so well with the dwarfer American shrubs.

The *Rhododendron* heads the list of American shrubs, and, as a rule, so well does it thrive in this island home of ours, that in some neighbourhoods it has completely altered the character of the scenery, especially in the spring, when the woods are lighted up with its gorgeous clusters of blossoms. At Cobham Park, in Kent, Portnal Park, Middlesex, Powderham Castle, and many other places in Devon and elsewhere—in fact anywhere in these islands where the soil is not impregnated with lime—the *Rhododendron* will thrive and blossom in a way which commands and receives unbounded admiration. The late Charles Dickens, whose residence—Gadshill—was near Cobham Park, speaks enthusiastically of the *Rhododendrons* there in one of his letters. I lingered about Gadshill the best part of a long day some years ago when the *Rhododendrons* were in their beauty, and though the masses which exist in such

abundance—covering something like 150 acres in the grounds and woods—are all of the common ponticum type, yet the effect of such a sight becomes indelibly fixed on the mind. Though the Rhododendron, the pride of the spring and early summer garden, is classed with American plants, yet it is not exclusively of American origin. The common species (ponticum), which is naturalised in our woods, is a native of Europe. The magnificent scarlet species (arborea) of our conservatories comes from India; and from the high mountain ranges of India a numerous and distinct, though a somewhat tender, race of Rhododendrons have been imported. Solitary species have been obtained from other countries, including Russia. From America, Catawbiense—a host in itself—and many other hardy species have been introduced, which in our gardens have multiplied exceedingly, throwing off many hybrid forms. It has been supposed by many that for its perfect development the Rhododendron requires peat or bog earth; but this is not so, as they will flourish very well if leaf-mould and old manure (preferably cow manure) be added to the soil. They delight in the moisture and shade of woodland districts of the southern and western counties, and they revel amid the rich alluvial deposits of old river beds. Knowing these facts, it is a comparatively easy matter to prepare a place for Rhododendrons. The site should be trenched up deeply, but not bringing any bad stuff to the surface. In extreme cases—to get depth of soil without undue elevation—the bad soil may be taken away. Anything in the way of decayed vegetable matter will do for the Rhododendron beds; chopped turf, leaf-mould, old hotbeds, cleanings of ditches, and charred refuse may be employed, but no lime or calcareous matter, for they will not grow on a limestone soil, and this fact must be kept in mind. Being of a fibry-rooted nature, Rhododendrons will always lift with balls, and there is less danger in transplanting than with most things. April and October are the best months for moving them, and if the work be done with care, there need be no fear of the result; but their permanent well-doing will depend entirely upon the preparation of the site; and a mulching with short manure immediately after planting is very important. After the flowering has finished, the seed pods should be removed from all choice specimens, as they tend so much to exhaust the plants. Shelter from cold winds is necessary, especially the first season of planting, as, if the plants have been obtained from a nursery, they probably have been taken from a well-sheltered situation. In cold districts, north or north-west of London, where the rainfall is considerable, less shade will be required, as without sunshine the wood will not ripen and the plant will not blossom freely.

The following list gives a good selection of varieties :—

Early-flowering Section.—Altaclarens (scarlet), Coccineum (scarlet), Albertus (white and pink), Broughtonianum (rose), Blanche Superb (white), Jacksoni (light rose), Campanulatum (creamy white), Desdemona (white, blotched crimson), Sir Walter Scott (pink, shading rose), Nobleanum (various), Marian (pink, dark spots), Victoria (purplish claret). The early section are well adapted for forcing for the conservatory. If potted in autumn before severe frost comes, placed in a cold house or pit, and introduced to a higher temperature about the end of November, the flowers will begin to open soon after Christmas. In the open border the early-flowering kinds suffer sometimes from the effects of frost, but with the protection of a glass roof the colours come out bright and uninjured in great trusses. There is no class of plants which produce so much blossom on so small a surface with so little trouble.

Medium and late-flowering Varieties.—Atrosanguineum (dark red), Alarm (white, edged with scarlet), Albion (red spotted), Alaric (clarety plum), Amethystinum (blush, tipped puce), Blandyanum (rosy crimson), Black Prince (very dark), Beauty of Surrey (rose spotted), Delicatissima (pale pink, fading to white), Iago (rosy crimson), Comet (scarlet), Faust (rosy lilac), Everestianum (rosy lilac), Hugh Fraser (purple), Ne Plus Ultra (purple, light centre), Earl of Rosslyn (claret), Elfrida (rosy crimson), Fleur de Marie (rosy crimson and white), Hannibal (bright rose), Sir Charles Napier (rose), Helen Waterer (white and crimson), Hogarth (rosy crimson), John Waterer (glowing crimson), Lady Armstrong (pale rose), Stamfordianum (claret), Minnie (white and chocolate), Mrs. Standish (white, brown spots), Schiller (purple), Lady Dorothy Neville (purple), Perspicuum (pure white), Lord Clyde (crimson), Lord John Russell (pale rose), Maculatum (light blush, orange spots), Standish's Perfection (pale peach), Old Port (rich plum), Paxtoni (rose), Prince Albert (deep crimson), Prince Camille de Rohan (white and rose), Princess Mary of Cambridge (white and rose), Titian (rosy scarlet), Zuleika (white and rosy pink).

Besides the beauty and grandeur of its blossoms, the Rhododendron, as an evergreen shrub, has few equals. To see it growing in the southern and western counties in the utmost luxuriance, 20 feet high or more, with the regularity, exactness, and refinement of growth which is possessed in the same degree by no other shrub, is a sight not likely to be forgotten. All things are great or little by comparison, but to see a hillside clothed with Rhododendrons at any season of the year is a pleasing sight.

Usually there are inequalities in the surface of dark green leaves which cause pleasant flickers of light and shade to break forth, bringing into prominence some hitherto overlooked feature. The *Rhododendron ponticum* and its varieties are excellent evergreens for planting in woods to form shelters and covers for game. The severest frost never injures them, and rabbits, those pests in ornamental woods, never touch them. Do them justice in planting, for whoever plants in badly-prepared ground does not deserve success.

The Hardy Azaleas are closely related to the *Rhododendrons*, and will succeed under similar conditions. The common kinds make fine masses in the open glades of the shrubbery or wild garden. The common yellow-flowered kind (*ponticum*) in a mass is very beautiful, and so sweet, filling the air in its neighbourhood with fragrance of a most delightful kind. During the last twelve years or so a new race of these hardy Azaleas has been introduced from Japan, having larger flowers of a more perfect shape than the Ghent or *ponticum* varieties. Though perfectly hardy, their early-flowering habit is against them in our climate, as their broad petals offer so much resistance to the wind, from which, in our cold springs, they are liable to suffer injury. But few things surpass them for forcing for the conservatory, and they may be lifted from the border with balls of fibry roots any time, and be planted out again after the growth is completed. I append a short list of varieties of both the Ghent and Japanese sections:—

Ghent Varieties.—Admiral de Ruyter (scarlet), Altaclarensis (yellow), Augustissima (red and yellow), Beauty of Flanders (sulphur and salmon), Carnea elegans (light pink), Decorata (pink), Fulgidæ (orange scarlet), Géant des Batailles (crimson), Julius Cæsar (scarlet and orange), Miniata floribunda (shaded pink), Nancy Waterer (yellow and salmon), Ne Plus Ultra (orange scarlet), Narcissiflora (primrose yellow), Nobilis (salmon red), Princesse d'Orange (salmon pink), Rosea formosissima (blush pink), Rubens (red and orange), Van Dyck (red), Van Houtte (red and yellow), Splendens (orange scarlet), Versicolor (shaded pink).

Japanese Varieties.—Azalea mollis.—Alphonse Lavallée (orange and scarlet), Baron Edward de Rothschild (red and yellow), Charles François Luppis (rose and magenta), Comte de Gomer (rose, orange spots), Comte de Quincey (yellow), Consul Cérésolé (red, orange spots), Dr. Leon Vignes (white, shaded with yellow), Ebenezer Pipe (salmon red), Isabella Van Houtte (yellow), M. Jules Putzeys (red), M. Arthur de Warelles (salmon), Consul Pécher (rose). For forcing, the unnamed seedlings are very suitable, and much variation of colour is obtained.

Azalea amoena and *A. a. splendens* are low bushes with small crimson flowers, excellent for rockery or for front plants in the American border.

I have often thought if instead of the owners of gardens following in each other's track so blindly, or permitting the fashionable landscape gardener to lay down everywhere his leading idea, they would think a little for themselves, and then give shape to their thoughts in their gardens, and follow out this thought, those who loved hardy things, whether of flower, tree, or shrub, might find a good deal of scope for their energies in the garden of American plants. Devoting oneself to any special object would lead to more variety in gardens generally. The *Kalmias*, *Ledums*, *Menziesia* (Irish Heaths), *Pernettyas*, *Vacciniums*, *Andromedas*, are all fine subjects for the American garden, and will succeed under like conditions to the *Rhododendrons* and *Azaleas*. The hardy Heaths are a numerous and most interesting family, well adapted for occupying front positions.

Selecting Trees and Shrubs.—Before leaving this part of my subject, I should like to say a few words upon the importance of planting none but healthy, well-formed specimens. There is a certain percentage of weaklings in all races of living things, and in the case of trees and shrubs the judicious planter casts them on one side. No amount of skill can develop the constitutionally weak into strong, healthy, full-grown specimens. This to some may be a matter of small importance, as a tree is a tree, even if it be small and deformed. In selecting those of spiral habit, such as the *Cupressus*, *Biota*, *Arborvitæ*, etc., take none but those which have been trained to one central stem. Those trees which have developed several leaders will be an endless source of trouble as they grow old and have to meet the full force of the wind. And as regards what has been happily termed pictorial trees, they should possess strong, healthy, well-formed stems, and evenly-balanced heads. Selected plants may cost a little more in the first instance, as everybody must be paid for work done ; but the result will be, under all circumstances, more satisfactory.

CHAPTER XI

THE ROSERY

IN some gardens this only forms an adjunct to the other departments, in others the Rose is the dominant flower, monopolising most of the time and thought of the cultivator. Where one has the time and the space to gather together all the known species of the Rose, cross and intermarry them, and sow the seeds, a most interesting progeny may be raised; or, if the numbers are embarrassing, select the most distinct families and try to originate a new race. If intelligently and persistently worked, something would grow out of it. The Rose will not flourish on a starveling diet, and neither does it take kindly to formal gardens; and yet, if one wants to enjoy Roses perfectly, they must be planted so that we can get to them, and this seems to imply that they should be planted near the paths, or else be grown on turf, but without any intervening border, or only just sufficient bare earth round each plant as to do away with the necessity of mowing quite close to the stem. The garden of Roses—where the Rose forms the main feature—should, I think, be in two parts. The experimental portion might be away in a paddock or field, or anywhere out of sight, so that the cultivator might work out his ideas in peace. The show part of the Rosery would, of course, occupy a more conspicuous position. The best specimens might be planted by the side of the path, either on the border or on the grass. They may be ranged sometimes in groups of different sizes, with room to move easily among them. The climbers and ramblers might be trained over rustic arches or on walls or buildings. Some of the less rampant growers may be trained to poles or employed to cover screens of wire or wood.

Standard Roses on tall stems have rather lost caste of late years. Not only have they an unnatural, incongruous appearance, but the plants under such conditions are shorter lived, many perishing during severe winters. A few standards from 3 to 3½ feet in height may be admissible as background plants, but the general collection should be budded or grafted close to the ground, or else be obtained from cuttings.

Position and Soil.—The Rosery must occupy a sheltered situation, as cutting winds are ruinous to both flowers and foliage. The best soil is a deep adhesive loam resting on clay. The site must be thoroughly drained—that is, the water that falls in winter

must pass rapidly away. The best results can only be obtained by a deep soil ; not less than 2 feet will suffice, and if deeper it will be better. To improve a cold clay soil, after the drains have been put in $3\frac{1}{2}$ feet deep, collect together some of the clods of clay when dry and burn them, spreading the ashes to the depth of 6 inches over the beds intended for Roses, and trench the land over, mixing all together, adding manure as liberally as necessary or convenient—and it is not easy in this respect to overdo it. For autumn planting the preparation of the ground should take place in August, to give time for it to settle, and for the sunshine and the atmosphere to work upon its surface to pulverise and sweeten it. For planting in spring on cold land, the burning may be done in August and September, the trenching immediately after, when the storms and frosts of winter have worked upon it.

Planting may take place early in March. When Roses are planted in March the pruning should be delayed till the buds are bursting, then cut hard back—that is to say, cut within two, or, in the case of the strongest shoots, three eyes of the base. I have seen Roses planted in the first week of March do remarkably well, especially when the land has had a thorough winter's preparation. But if I were going to plant a Rosery in spring, I should, if possible, buy the plants not later than November, have them home at once, shorten their roots a little, and lay them in by the heels in a slanting position in a dry border. Not only should I get the pick of the plants in the nursery, and probably secure them of stronger, healthier habit, but I should expect them to gain some advantage from having their wounded roots healed over, and they would also have made some new roots, or the latent rootlets would be ready to start, and the plants would be in a far better condition for commencing a new life than if only just lifted. If standard Roses are planted, the stems must be supported by stakes immediately, and the surface round the stems should be mulched with manure. If Roses are grown on the bed system, a better effect may be obtained by planting standards and dwarfs alternately, finishing off with a row of dwarfs round the outside. In this way we get the beds elevated without any exposure of naked stems.

Dwarf Roses.—Some people adopt what is termed the pegging-down system, which means that all the strong shoots, instead of being pruned back, are bent over, and the end layered into an open space. In the course of time most of these layered shoots form roots and become independent plants. The very first garden I worked in many years ago had several large beds of dwarf

Roses worked on this plan. They were mostly of the old-fashioned summer-blooming kinds, such as the Cabbage or Provence, the York and Lancaster, the Maiden's Blush, and others that would be difficult to find now. In pruning the plants, all the strong shoots were left to peg down, and the plan answered well, as the beds were kept full of healthy growth, which was the main thing sought for.

In the course of time the Hybrid Perpetuals ousted all the old Roses from the beds. I remember what a *furor* of excitement was caused among us when Géant des Battailles was introduced, and also the efforts we made to work up a stock quickly. But the whirligig of time brings its revenges, and the Géant in its turn had to give way to others. I cannot say that I like pegged-down Roses, as I prefer to grow them naturally. Some Roses, when pegged down, throw up strong wood from the base, which crowds out the flowers and occupies the centre of the bush completely. I think it is better to let the Rose grow into a natural bush, with just the necessary pruning to keep the tree well balanced. The flowers on pegged-down Roses are often disfigured and splashed with earth from being so near the ground. As regards

The Pruning of Roses, no inexorable law or rule can be laid down, as so much depends upon the way in which the wood has been produced, and every distinct family requires to be treated in a different manner. The old-fashioned summer Roses that we planted in large masses thirty or forty years ago were always pruned during autumn or winter, and were cut back more or less according to strength, thinning out the head well before doing the shortening. When the hybridist gave us the Perpetuals this system of winter pruning had to be altered, for the new-comers were of an excitable nature, and would, in our mild winters, show their parentage by breaking into growth prematurely before the weather was ready for them. So it was found the pruning had to be delayed till March, and sometimes—especially with newly-planted bushes—till April. As regards the manner of performing the operation there was not much change required. All weak shoots must be cut away, to leave room for the development of the stronger eyes which burst forth from the more vigorous shoots. It is the same with Roses as with fruit trees or other plants. Overcrowding wood or foliage does not pay. There must be space for the young shoots which are to produce the future blossoms to grow. And it is equally important that space should be given to ripen the wood for the next year's crop, although this is sometimes lost

sight of. The thinning being accomplished, the shortening requires some knowledge and judgment. If a large number of flowers are wished for rather than a few of extra merit, the flowering shoots may be left longer in proportion to their strength, or say from 8 inches to 10 inches; but to obtain very fine flowers for exhibition we must cut pretty hard back, for the finest blooms will be near the centre of the tree. And it is always best to cut to dormant buds—that is, those which have not yet started into growth. The same principle should guide us in pruning Tea Roses.

A dormant bud on a well-ripened shoot will make a better growth and produce a finer flower than can be obtained from one of those excitable buds which has had no rest. The same rule, too, holds good as regards thinning, cutting away the weakly shoots, and leaving the strong, well-matured buds to form the future tree. Some say Tea Roses should not be pruned much, and no doubt more blossoms can be obtained for a time from an unpruned bush; but if we want quality we must cut to ripened wood and buds. As regards Noisette and other vigorous-climbing Roses, the finest flowers are produced from the strong well-ripened buds on the vigorous young shoots which have grown out alone into the air and been exposed to the sunshine and the motion of the air; and the pruning of such plants should be confined to the thinning out of weak shoots to make room to lay in the strong growths at full length, or nearly so, just merely shortening back the soft tips a little. From the middle to the end of March is the best time in the average of seasons to prune Roses. If pruned earlier, the eyes left may break and be injured by the late frosts; and if delayed longer than March, the strength that has been used up in developing the early growths will be cut away and lost.

Transplanting Roses.—No matter how well the ground was originally prepared for the Roses, the time comes when a change is necessary—unless the plants have been planted singly about the grounds. In this latter case the bush extends its branches in proportion to its roots, and a healthy reciprocity is kept up; but, in many instances, either the plants break out of hand and make gross wood (which, in consequence of deep-rooting, does not ripen well), or else the soil settles too closely about them, acquiring too great a degree of firmness, which gradually causes the plants to lose force and strength. In both these cases lifting and transplanting is a decided advantage. Where the plants have become gross, the long naked roots should be pruned back. In the case of the weak plants this will not be necessary, but re-planting them into freshly-worked land will give them a new

lease of life. The autumn is the best time to rearrange Rose plantations in the way I have suggested. The plants must be carefully lifted, and if they are on their own roots some of the strongest may be divided and made into several. Others that have proved of delicate constitution will be discarded to make room for a few from the list of new Roses which are annually offered. In this way the collection will be kept up to date.

The exhibitor will, of course, attend all the great shows, and mark whatever takes his fancy among the new Roses offered. Whoever becomes enamoured of the Rose should learn to propagate it, for it is necessary to keep adding fresh blood every year, either by purchase or by home propagation, and the wisest plan is to combine the two—that is, buy the new Roses, and always keep a few stocks ready for working at home. Much has been written and spoken as to which is the best stock for the Rose; of course for standard Roses the Brier—by reason of its straight stem and the ease with which it can be obtained (it being a wildling)—will always be a favourite; but for dwarf Roses on indifferent soils the Manetti is the better stock, by reason of its robust habit; in fact many people could hardly grow Roses at all without the Manetti stock—it will thrive on inferior land that would kill the Brier. If the plants are inserted deep enough in the ground so as to bury the junction where the bud was inserted, in the course of time roots will form on the stem of the Rose itself, so that virtually the Roses will be on their own roots. Whatever may be said to the contrary, I believe the introduction of the Manetti stock has given an immense impetus to the cultivation of the Rose. Other Roses, such as the Boursault and various kinds possessing vigorous constitutions, may be used as foster parents for delicate growers, and there is yet room for experimenters to work in this direction in the selection of suitable stocks for special classes of Roses.

Rose Stocks.—Both the Manetti and the Briers are easily increased to any extent by cuttings, and in the preparation of these, which should be from 8 inches to 10 inches long, some pains should be taken in the removal of the eyes or buds from the base and upwards, except the uppermost eyes, which are left to form the heads of the plants. The cuttings should be prepared early in the autumn, not later than the beginning of November, and, if possible, planted at the same time, or at least laid in the soil, so that the work of hardening and healing the wounds may be going on. They ought to be planted in rows 1 foot apart, burying them up to the eyes, which are left to form the growth. The best way is to make a nick by the side of the line with the

spade, deep enough to receive the cuttings; then press them into the nick until they rest on the firm bottom, making the soil firm about them, afterwards drawing it up round them with a rake. The cuttings may be planted thickly, as probably they may not all grow, though if the work has been carefully done early in the autumn the failures will be few.

Cuttings from the Brier may be rooted in the same way. The strongest one-year-old wood should be selected for cuttings, and where the branches can be had with a heel (if only a few are required), it will be an advantage to have them so. At the end of the first year the rooted cuttings of Manetti should be lifted and planted in nursery rows 3 feet apart and 1 foot from plant to plant, for budding the following year. The same care in removing all eyes or buds from the lower part of the stocks must be observed as in the case of cuttings; if eyes are left, they give so much trouble when they develop (which they will do) suckers underground. All the roots must be cut away from the upper part of the stocks, as the latter must not be planted so deeply in the ground as when it was a mere cutting without roots. The object of this is to enable the bud to be inserted as near the bottom of the rooted cutting as possible, so that when it becomes a Rose the stock may be buried out of sight altogether, and the Rose ultimately be on its own roots. The same routine will be performed with the dwarf Brier. To make standards the Briers should be planted early in autumn in nursery rows 3 feet apart, be secured from the winds, and mulched with long manure to encourage the formation of roots.

Budding Roses is easy and simple; after a little practice any one may do it successfully. The chief thing is to select the wood when in a right condition—when it is neither too soft nor too firm. The experienced budder can tell by the feel of the young wood if the buds are likely to take, and this is the reason why an experienced man seldom fails to make his buds grow. Unless the conditions of success are present, he waits till they are. Very often in dry hot weather the bark is dry and harsh, and the buds, if inserted then, will not grow; but by waiting a day or two a shower may come and liberate the bark, and then scarcely a bud fails. It is mainly a question of waiting and watching. Standard Briers require more care and patience in waiting till the bark is in the right condition than the dwarfs, and the Manetti may be budded as late as September. Therefore, as soon as budding can begin, which will be early in July, attend to the standard Briers first, then the dwarf Briers, and lastly the Manetti. In budding dwarf Roses—both the Briers and the Manetti—it may happen

that by the removal of a little earth with a sharp pointed stick from around the collar of the plant on the north side, that moist bark will be found, which will work freely in the hottest weather; and the lower the buds are inserted in the side of the stock the better for the plants. Having made sure that the bark of the stock works freely, then look up the buds, and where there is a good collection of Roses grown, some will be sure to have suitable buds fit for working. In budding several of a sort, it will be better to do them all at the same time if possible, as then one label will do, and it is always desirable to have the names or numbers placed on the rows of plants as the budding is proceeded with. The knife must be very sharp; indeed, no one should perform any operation that requires the severance of young tissues with a blunt instrument, and in the case of standards the buds must be placed on the upper side of the young shoot, close to the main stem. When the operator has gained experience and confidence, one bud in each stock will do; but amateurs may with advantage, in disbudding the stocks, leave two shoots if well placed. I should have said that, during the spring, the stocks should be attended to, and all useless growth removed. It is best to bud in showery weather, or on dull days in the evening or early in the morning; or if the work must be done in bright sunshine, as much expedition as possible should be used in tying in the buds. There is no advantage in making the shield of the bud larger than from half to three-quarters of an inch in length, and of proportionate width. Large shields involve more mutilation of the stock, and are more difficult to manipulate. The wood from which the buds are taken should have been previously cut from the plants, the leaves removed, leaving about an inch of the leaf-stalk or petiole. The little bundles of young shoots are then labelled and placed in a pan or a pail partly filled with water to keep them fresh. A bundle of slips of soft tying material are also prepared and kept in the water. Remove the buds from the parent branch by making an upward cut, beginning a short distance below the bud, taking off a thin slice of wood with it; then, by a little jerk with finger and thumb in contact with the point of the knife, extract the wood from the back of the bud, leaving the centre or eye of the latter intact. The pressure should be applied from the lower end of the shield, and as this is a most important operation, much care should be exercised; for if the centre of the bud comes away, or is injured by extracting the wood, it cannot grow, and all our work will be useless. When I have cut out the bud to my satisfaction, I place it in my mouth whilst I prepare the stock for its reception, which is only the work of a very few seconds. An upward longitudinal cut is

made just through the bark of the branch in which we intend placing the bud, starting away from near the main stem. This cut should be a trifle longer than the shield of the bud, in order to permit of the latter being easily pushed under the bark. A transverse cut is made also just through the bark a short distance from the upper end of the cut lengthwise of the branch, and intersecting it. The ivory handle of the budding knife is then used to detach the edges of the bark from the wood, which, if all works well, will be a very easy matter; the bud is then slipped in and pushed home, and tying-in completes the process. In nurseries the young shoots in which the buds are inserted are not, as a rule, headed back till the following spring, it being considered that the plants from buds remaining dormant are the stronger for their long period of rest. In this way I have seen very strong plants from one season's growth. But when the stocks are strong and well established, and the buds are inserted early in the season, if the stocks are headed back as soon as the buds are swelling and showing signs of growth, a crop of flowers may be obtained in autumn.

Grafting Roses.—This is usually practised in spring under glass, and is mostly confined to nurseries, though for a good many years past I have annually grafted a few Roses,—there is so little trouble, when one has a hotbed at work, to graft a few dozen of the choicest kinds. Just about the time the Briers are pushing their buds on the south side of the hedges on the warm sunny banks, I, accompanied by a man with a spade, go into the fields. In the course of a very short time we come back with a basketful of roots of the common Brier, or Dog Rose. These are cut into rather small pieces, each piece having a fibre or two to lead it into growth. The grafts are procured from plants when the buds are dormant, and are cut into pieces about 4 inches long. A slice is cut off one side of the thick end of the root, and a corresponding slice is cut off one side of the graft at the lower end. The two cut edges are fitted and bound together, and all the grafted roots are potted into as small pots as they can be got into nicely; usually 4-inch or 5-inch pots are the best. The pots are then plunged into a bottom-heat of 75°, kept close, and, when the sun shines brightly, shaded by laying a mat over the glass. When the grafts have shot forth several inches, ventilation will be required, and less shading should be used. The growth is very rapid with plants propagated in this way. They may be planted out and be in flower by August if well cared for.

Roses from Cuttings.—There are many ways of striking Rose cuttings, but the best I have yet seen or practised is to pre-

pare a bed with a very slight bottom-heat about the end of July or the beginning of August, when the young wood is getting a little firm. A hotbed that has been used for propagating bedding or other stock in spring, and that has parted with a portion of its heat, will do very well. On the bed place 6 inches or 8 inches in depth of Cocoa-fibre refuse in a partial state of decomposition, and in this dibble the cuttings. The latter should be taken from healthy plants; if they possess a heel all the better, but they will root without it. The frames must be kept close and shaded. The exhausted Cocoa-fibre does not part readily with its moisture, therefore very little water will be required. Its great utility as a medium for rooting cuttings consists in this even state of moisture, as most of the mortality among cuttings arises from damp being present in excess. As soon as the cuttings have made roots half an inch or so long, they should be lifted carefully out of the bed, potted, and kept in the same temperature under like conditions until they have made some growth, when they will bear removal to a cool frame to be hardened off. Another way of striking Rose cuttings is to plant them in the open air early in October, making all firm about them, and sheltering with a little dry litter in cold frosty weather. Roses may be rooted from cuttings in pots under glass in spring; the cuttings to be taken from plants that have been forced.

VARIETIES.—The following list includes the best varieties in the various sections:—

Hybrid Perpetuals.—Captain Christy, Duchesse de Vallombrosa, A. K. Williams, Alfred Colomb, Abel Carrière, Avocat Duvivier, Anna de Diesbach, Antoine Ducher, Baroness Rothschild, Boildieu, Beauty of Waltham, Comtesse de Serenye, Cheshunt Hybrid, Comtesse Riza du Parc, Charles Lefebvre, Countess of Oxford, Duke of Connaught, Duc de Montpensier, Duchess of Bedford, Dupuy Jamain, Emily Laxton, Empress of India, Etienne Levet, Emilie Hausburg, François Michelin, Gabriel Tournier, Hippolyte Jamain, Jean Liabaud, John Stuart Mill, Jean Soupert, John Hopper, Julius Finger, Jules Margottin, La Rosière, La France, Lord Beaconsfield, Louise Darzens, Mons. E. Y. Teas, Mrs. Baker, Mdlle. Marie Finger, Marguerite Brassac, Mdlle. Marie Cointet, Madame Lacharme, Miss Hassard, Mrs. Laxton, Magna Charta, Madame Prosper-Laugier, Mdlle. Bonnaire, Mdlle. Marie Rady, Marchioness of Exeter, Mabel Morrison, Madame Ferdinand Jamain, Madame Nachury, Marie Baumann, Marquise de Castellane, Oxonian, Prince Arthur, Princess Beatrice, Prince Camille de Rohan, Reynolds Hole, Royal Standard, Star of Waltham, Sultan of Zanzibar, Sir Garnet Wolseley, Rev. J. B. Camm, Penelope

Mayo, Perle des Jardins, Xavier Olibo, White Baroness, and Merville de Lyons.

I believe I have culled the best from among the large number of Hybrid Perpetuals now in the catalogues, both for exhibition and also for the garden.

Soil and climate have an effect upon Roses, as well as all other things, and for that reason I have given a longer list than some may think necessary. But the Hybrid Perpetuals are the most useful section of the family, and in dealing with the other branches I will be more moderate in my desires.

Perpetual Moss Roses.—James Veitch, Madame Moreau, Blanche Moreau, Mrs. W. Paul, Soupert et Notting, Perpetual White, Salet.

High feeding and close winter pruning are among the necessary requirements of Moss Roses.

Bourbon Roses.—Acidalie, Baronne Gonella, Emotion, Gloire de Rosamene, Louise Margottin, Queen of Bedders, Queen of Bourbons, Souvenir de la Malmaison.

The Bourbons are very free and continuous bloomers.

Tea and Noisette Roses.—Anna Olivier, Alba Rosea, Adam, Aline Sisley, Belle Lyonnaise, Bouquet d'Or, Catherine Mermet, Celine Forestier, Comtesse de Nadaillac, Comte de Paris, Caroline Kuster, Devoniensis, Gloire de Dijon, Homère, Innocente Pirola, Isabella Sprunt, Jean Ducher, Jean Pernet, Lamarque, Marie Van Houtte, Maréchal Niel, Madame Willermoz, Madame Falcot, Madame Lambard, Madame Margottin, Madame Berard, Madame de St. Joseph, Moire, Niphotos, Perle des Jardins, Perle de Lyon, President, Reve d'Or, Rubens, Souvenir d'un Ami, Souvenir d'Elise, Souvenir d'Paul Neron, Safrano.

China Roses.—These are not numerous, but several of them, including the common old blush or pink and the crimson, are good for bedding, as they will flower in a sheltered situation pretty well all the year round. Louis Phillipe, Ducher, Fabvier, and Mrs. Bosanquet are useful for bedding or planting in masses anywhere. The old Pink China, for instance, in a large mass, never seems out of place anywhere. The Fairy Roses belong to this section.

Summer Roses.—The Provence or Cabbage Rose, with its large, fragrant, rose-coloured flowers, has been got rid of in many gardens, to the great regret of those who have so unwisely discarded an old friend. The old white Provence is a very beautiful Rose, especially in the bud state. I have seen an old-fashioned garden with some rare wide-spreading bushes of it. The old York and Lancaster Rose is very scarce now. I only know one garden in Ramsey, Hunts, possessing it in any abundance. Apart from the legend

woven around the name of this old Rose, it is a desirable variety to possess for the sake of its sweet striped flowers. Among those which only blossom in summer, Moss Roses deservedly hold a high place. In the bud state they are most beautiful, and quite a long list are catalogued now, running through many shades of colour, from the pure white of the White Bath to the rosy pink of the common sweet-scented Moss, which is so largely sold in the streets. Angelique Quetier, Celina, Crested, Little Gem, Marie de Blois, and Reine Blanche, are the cream of the Moss Roses. Among summer Roses the Austrian Briers (*Rosa lutea*) form a distinct though a limited class, which in the bud state are most beautiful. These should not be pruned very close unless the wood is weakly, as the blossoms are produced from well-ripened wood only, and if pruned hard back the best flowers are cut away. Like all the summer (and indeed all other Roses for that matter), liberal treatment is necessary to produce fine blossoms.

Climbing Roses.—These comprise the Boursault—Amadis, De Lisle, and Gracilis; the Ayrshire—which includes the Dundee Rambler, Queen of the Belgians, Ayrshire Queen, and Splendens. The evergreen Roses are excellent for covering quickly walls and buildings, or training over arches or up pillars. Adelaide D'Orléans, Félicité Perpétuelle, Leopoldine D'Orléans, Princess Louise, Rampant, and Reine des Françaises, are the best and most useful kinds. The Banksian Roses are beautiful in spring and early summer on a wall, but require a dry, warm, sheltered place. The young shoots should be trained thinly, and not shortened much; in fact all the wall or climbing Roses should be pruned long, *i.e.* the weakly shoots to be well thinned out, and the main branches only to have the soft unripe points removed. But to cover a wall with really handsome Roses I should recommend the fast growing Teas and Noisettes, such as Maréchal Niel, Gloire de Dijon, Souvenir d'un Ami, William Allan Richardson, Jaune Desprez, Triumph de Rennes, Celine Forestier, Lamarque, Cheshunt Hybrid, Climbing Devoniensis, Bouquet d'Or, etc.; Jaune Desprez I strongly recommend. It is a rapid grower, and blooms continuously, and the fawn-coloured buds are so sweet and nice for cutting. The plant, too, is longer lived than many of our Roses are. More than twenty-five years ago a little plant was set against a cottage in Norfolk. It is now a grand old plant, producing annually thousands of flowers. It is true that it is not met with on the exhibition table, but what of that? We are not all exhibitors, and those who simply want a Rose to cover the gable-end of the house, and to be continually laden with buds and blossoms, may safely plant it alongside of Gloire de Dijon. Several of the Hybrid Chinas are

well adapted for clothing walls and pillars ; Vivid, Catherine Bell, Princess Louisa Victoria, Selina (an American Rose), Fulgens, and Madame Plantier, are the cream of them. The Japanese have their Roses, though it is only within the last few years that they have been brought into notice. Paquerette, Mignonette, and Perle d'Or are very pretty dwarf cluster Roses from Japan ; and Simplex, a new single Rose from the same interesting country, will probably be sought after by those who are smitten by the growing taste for single flowers. Then in the Rugosa section we have a class of very handsome single Roses, which everybody should grow, for both flowers and foliage are exceedingly chaste and beautiful, and after the flowers come the fruit, which is no mean ornament. There is yet one more little Rose I should like to notice, and that is the Alpine Rose, *Rosa pyrenaica*, also a single-flowered kind ; it should be planted on the rockery and allowed to spread. The fruits, which are large in proportion to the other parts of the plant, are very bright and showy.

CHAPTER XII

BEDS OF SUMMER AND AUTUMN FLOWERS

THE bedding system, as it was understood and carried out fifteen or twenty years ago, is being gradually refined away, and it is never likely again, at least in our day, to obtain the hold over people's minds it once possessed ; and those who have shaken themselves free from its toils are wondering what they could have seen in it to make so much fuss about, though it may linger in a limited degree in large places and public gardens and parks, where the object is to catch the public eye, for sometime longer ; and in point of fact, in our gloomy, often foggy climate, I do not see what there is to object to in a mass of warm-coloured flowers anywhere, if moderation be observed. What so disgusted thinking people was the outrageous manner in which beds of *Pelargoniums* and *Calceolaris*, and similar things, were stuck about in every vacant spot, to the exclusion of better things. If the bedding system had been confined within the limits it had risen to, say thirty-five or forty years ago, in well-managed gardens, there would have been little to complain of. It was the craze that afterwards set in which led to the rooting up of so many good old things, and produced the present strong reactionary wave. People, otherwise sensible, seemed to have run wild upon this idea of bedding out. Only a dozen years ago little bits of variegated *Geraniums* that

might be taken away in one's waistcoat pocket were worth, according to the nurserymen's price lists, several guineas each. But a better, healthier time has come, thanks in a great degree to the exertions of one gentleman (Mr. Wm. Robinson), who at first almost single-handed commenced an energetic attack upon the extravagant folly of the times, so far, at least, as it referred to and had an influence upon gardening. But that folly is nearly dead, and is not likely to be resuscitated, so I need not waste words over it. But, as I have already said, a bed, or even a group of beds, of bright-flowered exotics may often be used with advantage to give warmth in our damp climate in association with other quieter tints. This thing is pretty well understood even in the best managed gardens. It would be difficult to find a good garden where the rein was given so freely as was formerly the case to lavish displays of colour. In hundreds of country gardens bright green turf now occupies the site of the ribbon borders and polychrome patterns of the past, and inquiries are everywhere heard about good hardy plants and shrubs. This is on all hands deserving of encouragement, as denoting a healthier state of public taste and feeling, and this, too, must be my excuse, if any be needed, for the prominence I have given, and shall continue to give, to hardy subjects in these pages.

There is no reason why beds devoted to the bedding system, pure and simple, should not always be full of flowers. If the design, from its size, entails too much labour to keep up a succession of flowering plants, it is clear that the design is too large, and should be reduced. It will be far more satisfactory, if we are to have a group of beds devoted to bedding out, that its size should be well within our means. Half a dozen beds well filled will afford more pleasure than a dozen badly done. Intricacy of design is in every way a mistake, as simple graceful forms are the most pleasing, and anything which is placed in a prominent position should be calculated to give pleasure under all conditions and circumstances. One never tires of a circle or an oval, and such simple figures are easily planted, and will fit in appropriately everywhere. A group of beds, whether a true geometrical pattern or simply a combined group of ovals and circles, if they occupy a prominent position, should in spring overflow with bulbs, Pansies, Daisies, Wallflowers, and autumn-sown annuals. There is nothing easier than to obtain a good spring display, as the materials are abundant, and, being hardy, are not costly. After the spring flowers are cleared off in May, the beds should be prepared for the exotics, and this preparation is an important matter. I know of several instances of friends whose summer beds failed because they had for the moment for-

gotten that land which is always at work must have very liberal treatment. After the spring flowers are removed to the rubbish heap, or in some cases to the reserve garden, dress the beds heavily with compost in which charred refuse forms a part. I find this better than all manures; it fills the cracks of the soil between the clods, and the roots of the plants seem to work in it so freely. Often in May the land that has been under crop in spring turns up rough and dry, and as the beds cannot be long exposed for the air to perform the amelioration, something must be added that will at once give tone to the soil, and, by blending with it, destroy its harsh outline and character. Charred refuse mixed with earth and leaf-mould meets the difficulty thoroughly.

Beds of differently-coloured Pansies are very pretty in spring, and if they are well attended to they blossom well into the summer. Blue King, Golden Bedder, Magpie, and Blanche make a nice selection, though the latter, I believe, is a *Viola*. Daisies are indispensable in any spring bedding arrangement, white and pink at least. The Forget-me-nots and double yellow Wallflowers make a nice showy contrast; the *Polyanthus*, the Primrose, and Alpine *Auricula* for partially-shaded spots, and bulbs and autumn-sown annuals everywhere.

I need not say much about the tender exotics, as everybody must be familiar with beds of *Pelargoniums*. Of late years the progress has been chiefly in one direction, namely, trying to obtain *Pelargoniums* with large trusses of flowers. Though this may be right for plants in pots under glass, smaller trussed varieties are better adapted for our showery climate. I still keep a few of the old Tom Thumb, though otherwise I am so much under the influence of fashion as to grow the large trusses; but whenever rough weather comes on Tom is to the front and seems to enjoy it, whilst the fair weather kinds, with their immense trusses, rush up into growth and their flowers fail to open. During the last few years various expedients have been adopted with the view of breaking up the flat, dumpy, monotonous masses of colour in our gardens, the most successful being the introduction of tall plants, at more or less wide intervals, among the dwarf plants, the latter, in fact, being used to form the undergrowth; and sometimes this is done with foliaged plants, but generally now flowers are in the ascendant. I here give a few examples of those beds which pleased me most last year:—No. 1. Hardy herbaceous white Phloxes, with a groundwork of dwarf blue *Ageratums*; No. 2. *Lythrum roseum superbum*; groundwork white variegated *Geraniums*; No. 3. Perpetual Carnations and dwarf *Chrysanthemum Asters*; No. 4. White Paris Daisy and bright lake-coloured Tom Thumb *Nasturtium*; No. 5. *Acer*

gundo variegatum and scarlet *Vesuvius Geranium* ; No. 6. Tall blue Lupin and Harrison's Musk. It will be noticed that the plants named are mostly common enough and easily obtained. Many other examples might be cited, but it is hardly necessary. Those who like foliage might use the Castor-oils, *Acacia lophantha*, *Grevillea robusta*, Cannas, Solanums, etc., instead of flowering plants, or by way of a change. Mixed beds of two or more plants to make a change are lightsome and cheering. Everybody must be familiar with the shot-silk mixture of the late Donald Beaton's—purple *Verbenas* and *Manglesi Pelargonium* ; but there are plenty of effective mixtures, *Heliotrope* and *Abutilon Thompsoni* being one, and *Heliotrope* and *Gladiolus Brencchleyensis* being another. A very sweet and effective mixture may be formed with *Mignonette* and scarlet or pink *Geraniums*, the *Mignonette* to be pinched in occasionally to keep it within bounds. *Viola Blue Perfection* and white variegated *Geranium Flower of spring* always attract attention, and the old *Viola cornuta*, mixed with *Mrs. Pollock* or some of the golden tricolours, are equally quiet and effective. There are many kinds of hardy plants which will form very effective masses alone and unaided. The *Antirrhinums* or Snapdragons, sown in heat in spring, pricked off when large enough, and planted out finally in May, are quite a novel feature. After the usual way of filling the beds has tired one out, *Pentstemons* from seed are quite as effective treated in the same way, planted about a foot apart, and pinched in a little at first.

As an autumn flower, the *Lobelia fulgens* has few equals. I like to plant it thinly over a carpet of some low-growing plants with either golden foliage or flowers—the *Golden Pyrethrum* has often been used for this purpose, and the low-growing *Golden Mesembryanthemum* forms a good foil to the dark foliage and elegant habit of the *Lobelia*. The *Rudbeckias speciosa* and *Newmanni*, *Tritomas grandiflora* and *glaucescens*. The autumn flowering *Anemones* from Japan are unequalled. We had, I was told, the best mass of these last year to be seen for miles around. It was quite a feature from August till the frost came. *Fuchsias* may, with advantage, receive more attention ; the old hardy *Riccartoni* being exceedingly graceful and pretty. *Fuchsia globosa*, mounted on short stems, are very effective over a low contrasting groundwork of white or golden foliage. *Fuchsia Rose of Castile* may be as effectively employed with light-blue *Lobelias*. Masses of the *Celandine tree*, or the *Giant Knotweed*, will always present a striking feature in autumn. Clumps of *Lavender* and *Pampas Grass*, isolated on the Grass, are always effective ; and among foliaged plants which are easily raised, Cannas and

Castor-oil plants are cheap, the latter from seed, and the former by seeds and division of the roots. The roots may either remain in the ground all winter covered deeply with litter, or be taken up before frost sets in and placed on the border of the orchard house, or some cool structure where the frost is only just kept out. Single Dahlias pegged down make excellent bedding plants for large masses, and they may be treated as annuals, saving seeds from the best flowers, sowing them early in March in the hotbed, and planting out about the third week in May. Except for the purpose of perpetuating some special flower, there is no particular advantage in saving the old roots, or in buying named sorts for merely bedding purposes, as seedlings are very effective, only they cannot be relied on to come true to colour, as seeds saved from a white or yellow flower may produce plants bearing flowers of many shades of colour. With the aid of

Hardy Plants and Annuals a very pretty garden may be had without going to the expense of keeping a single plant through the winter under glass. Beds of Stocks, Asters, Phlox Drummondii, dwarf Scabious, Chinese Pinks, Marigolds, Violas, Verbenas, Petunias, Zinnias, Mignonette, Antirrhinums, Pentstemons, single Dahlias, Tom Thumb Nasturtiums, and the annual Chrysanthemums, with the different varieties of Calliopsis, will make a very pretty garden, more refined in aspect than if filled full of glaring colours. With a heap of fermenting materials in March, and a few frames or some old boards and lights to shelter and protect the young seedlings whilst tender, ten thousand, or at least enough plants for a good-sized garden, may be raised for a comparatively small cost—at least for a much less sum than by any other system. No great amount of heat is required to start all the seeds named towards the end of March, as the sun, with the aid of glass, will do most of the work. The seeds should be sown moderately thin in pans or pots. I cover with sand—the young seedlings push so easily through it—as it never cakes. I have, for the same reason, often used the fine dust from the coke heap, and finely-sifted ashes will do as well. This kind of covering prevents damping, and when pricked off the stems of the little plants come out clean and wiry. As soon as they are large enough to handle properly, give more ventilation to harden them for two or three days, then prick off an inch or so apart in boxes. I like boxes, because the little plants do not dry up so fast if hot weather sets in before they are planted out, and it economises space, as quite a small box will hold from 100 to 150 plants. Many of the biennials may be induced to flower the same year if the seeds be sown early in heat—Hollyhocks, for instance, and Foxgloves. Many of the annual

flowers are wet weather plants. The Asters, Violas, Marigolds, Chinese Pinks, and Phlox Drummondii seem all the brighter for a good washing, and in wet seasons, when the scarlet Geraniums have had all the brightness washed out of them, the annuals have been glorious. Nothing in the shape of moisture seems to hurt the Zinnias, and if flowers are required for cutting, the annuals again come to the front. But many of the less prominent annuals are very beautiful, and, if justice were done, they would be more lasting than they generally are. Take, for instance, the Candytufts; there is quite a variety of colours in the family, now—carmine, crimson, purple, and white, and if sown thinly, and singled out afterwards till each plant has a space of 8 inches square all to itself, a lasting and really choice display will be obtained; and the same thing will occur with nearly all other annuals. If the seeds are picked off as fast as they form, many of the best and showiest annuals will continue to produce successions of blossoms through the greater part of the summer. Take the case of Sweet Peas: as a rule, when they begin to form seed pods, the flowers cease to come, because the object of the plant's existence (namely, perpetuation) has been accomplished; but if the seeds are cut off, the plant puts forth crop after crop of blossoms until its strength is quite exhausted; and for this reason in cutting Sweet Peas for the vases in the rooms, instead of cutting single trusses, I cut off large sprays, which stimulates the plants to make new growth, and so a life of continual activity is encouraged.

Annuals for Mixed Borders.—The following are very pretty for the mixed border, or for filling in anywhere:—*Abronia umbellata*, *Acroclinium roseum*, Sweet Alyssum, *Bartonia aurea*, *Collinsia bicolor*, *Clarkia*, double purple, Candytuft, various, *Calendula meteor*, *Chrysanthemum coronarium*, C. double golden, *Convolvulus minor*, *Coreopsis Drummondii*, *Cyanus* (Cornflowers) major and minor, Devil-in-a-bush (*Nigella*), *Dianthus* (Chinese Pinks) in variety, *Gilia*, purple and white, *Godetia* The Bride, G. Princess of Wales, and others. *Gaillardia grandiflora*, *Gypsophila elegans*, Hawkweed, red and white, *Kaulfussia ameloïdes*, *Leptosiphon roseus*, *L. aureus*, Lupins in variety, Larkspur in variety, *Linaria aureo-purpurea*, *Linum grandiflorum rubrum*, Love-lies-bleeding, Mignonette spiral, *Nemophila insignis*, *N. maculata*, *Nasturtium* Tom Thumb varieties, *Papaver umbrosa*. The double Poppies are exceedingly showy, and if the seed pods are constantly removed, a succession of flowers is kept up for some time. *Portulaca*, mixed—very pretty for rockwork, *Saponaria calabrica*, *S. alba*, Sweet Peas, *Salpiglossis*, various, Sunflower, tall double—very effective for back of borders, *Eschscholtzia mandarin*, *Sphaerogyne speciosa*, *Viscaria*

cardinalis, Virginian Stock, *Tropæolum canariense* (Canary Creeper). To this list should be added a few Everlastings, including *Heli-chrysums*, various. *Xeranthemums*, white and purple, *Rodanthe maculata*, *Helipterum corymbiflorum*, *Ammobium alatum grandiflorum*, and the following ornamental Grasses, which are so desirable for mixing with cut flowers:—*Agrostis nebulosa*, *Anthoxanthum gracile*, *Briza gracilis*, *B. maxima*, *Bromus brizæformis*, *Eragrostis elegans*, *Hordeum jubatum*, *Lagurus ovata*, *Paspalum elegans*, *Pennisetum longistylum*, *Stipa elegantissima*.

The germination of seeds is mainly a question of preparation of the seed bed. When seeds fail to grow it is generally the fault of the sower. There are instances where the seeds have lost their vital principle before the seeds reach the sower, and of course no amount of care will cause a dead seed to germinate. In the case of a new plant much sought after, a good deal of useless stuff is palmed off as a sound article; but as a rule it does not pay a seedsman to send out bad seeds. Therefore, if seeds fail, except it may be in the case of some novelty in great demand, the cause is usually to be found in the manipulation of the sower. Some flower seeds are very small, and if these are scattered over a rough steely surface and scratched over with a rake, they perish without a chance of germinating. But if the surface had been sprinkled over with a thin covering of light sandy compost to form a bed for the seeds to lie on, and a further light sprinkling afterwards as a covering, and the back of the spade pressed on them gently to make the surface a little firm—if the seeds have any vitality in them they certainly will grow. Again, some people are over-anxious about earliness; they forget the value of the old proverb, “The more haste the less speed,” and they sow too early, and the little plants perish almost before life has commenced with them. The first week in April is quite early enough to sow flower seeds in the open border.

CHAPTER XIII

Winter Bedding.—Any kind of furniture is better than barrenness; so the beds, however meagrely planted in winter, look better for having some kind of furniture in them. I have known an air of homeliness and satisfaction imparted to a garden in a few hours for a temporary purpose by sticking branches of evergreens over the beds to make-believe there were little plants growing there. Where a stock of little shrubs of various kinds can be kept in reserve for filling only a few of the beds in winter, a

pleasant diversity of effects appropriate to each season may be created. Bulbs may blend with the shrubs for spring effect, and some beds may be planted altogether with spring flowers; and so the winter and spring may meet and blend in the garden without separating lines. Of late years considerable attention has been given to shrubs suitable for massing in winter, and below I give a list adapted for filling flower beds at that season, and, being frequently transplanted, they will remain at a manageable size for a number of years with a little pruning. The variegated Hollies and the spiral-growing conifers will take off the dumpiness of the low flat things: *Aucuba japonica*, *A. j. mascula*, *Buxus japonica aurea*, *B. suffruticosa argentea marginata nova*, *Cupressus Lawsoniana albo variegata*, *C. L. erecta viridis*, *C. L. lutea*, *C. L. nana glauca*, *Cryptomeria elegans*, *Erica herbacea carnea*, *E. vulgaris aurea*, *Euonymus radicans variegatus*, *Hedera* (Ivy) *arborea aurea*, *H. a. elegantissima*, *H. a. Regneriana*, *H. a. fructo-luteo* (yellow-berried), *Juniperus sabina* (Savin), *J. s. variegata*, *J. tamariscifolia*, *Laurestinus*, *Ligustrum japonicum* (Japan Privet), *Mahonia aquifolia*, *Osmanthus ilicifolius*, *Pernettya mucronata*, and others. The *Pernettya* has branched out under the hands of the hybridist of late years into many varieties, bearing different coloured berries. *Retinospora ericoides*, *R. obtusa aurea nana*, *R. plumosa*, *R. p. argentea*, *R. p. aurea*, *R. squarrosa Veitchiana*, *Taxus baccata aurea*, *T. elegantissima*, *T. aurea*, *T. elegantissima*, *T. vervaneana*, *Thujopsis dolabrata*, *Veronica decussata*, *Vinca elegantissima*, *Yucca recurva*, and others.

Of course scarcely any one garden would require all those named above, but everybody should possess a power of selection, and in all the large nurseries they may be seen, and examples of the best things for this purpose are frequently exhibited at the great London and other shows.

Change of Design.—The same groups of beds planted in the same way, with the same coloured flowers, must in time become monotonous. Even beds and borders of herbaceous plants are benefited by removal occasionally to a fresh site. When the beds or borders are surrounded by gravel the matter is not so easy, as it involves more work than just marking out a few beds on turf; but such work is exceedingly interesting, and it finds something for restless horticultural spirits to do and to think about, and keeps up a perpetual interest. We all need a change sometimes, and if we looked upon our flower beds and borders as movable objects, not only would these changes be pleasing in themselves, but our taste would be educated, so to speak, by familiarity with different combinations; and the grouping experimentally of plants and

flowers, and their numberless forms and types of beauty, would tend to increase the love of Nature, and raise up in us an earnest spirit of reverence and love for the good and beautiful.

Hardy Edging Plants.—Where a group of beds are expected or desired to be always in a bright, cheerful condition, the value of edgings of hardy plants or low-growing shrubs will soon meet with appreciation. A band of Ivy, 1 foot or 18 inches wide, will fit in appropriately in many places if well managed. If the design is on gravel, the Ivy may be used in the place of the Box; and on Grass, the green of the Ivy being of a darker tint, will form a harmonious band or connecting link between the Grass and the flowers. The Golden Yew, the Golden Box, the Silver Euonymus (*radicans variegatus*), the dwarf pink-flowered Heath (*Erica herbacea carnea*), the dwarf evergreen Barberry (*aquifolia*), several of the dwarf Japanese Cypressess, such as *Retinospora plumosa aurea* and *obtusa aurea nana*, and the *Vinca elegantissima*, will be useful. Then, for small beds, there are dwarf plants in great variety, of which I shall only name a few: *Arabis albida variegata*, *Stachys lanata*, Golden Thyme, *Festuca glauca*, *Lamium maculatum*. The variegated Coltsfoot is a very striking plant, either in a mass or as an edging, but it has one objectionable feature: when it dies down in winter it disappears altogether, but its underground stems continue at work, and it may perhaps come up in some other part of the garden in spring. I have a large bed edged with this Coltsfoot, and very striking it looks in summer; but the young offsets must be carefully sought for in spring, and be lifted with a piece of root attached, and planted again where they are to live during the summer. I have just been looking round the bed to find the whereabouts of the crimson and green-coloured leaves which are now rapidly rising through the ground. Some of the little bright offsets are in the grass 4 feet or 5 feet from their point of departure, others are as much the other way, having travelled into the centre of the bed. When one is acquainted with the habit of the plant, we know where to look for its uprising. *Sedum lydium* and *S. glaucum*, *Cerastium tomentosum*, and several of the *Saxifragas*, are pretty. Some of the plants named may be left from year to year, but the *Sedums* are best transplanted annually—at least I like to replant all the beds that occupy conspicuous positions. Edgings of Ivy are easily formed; the site should be well prepared, as even Ivy does best in good land made firm. If planted in autumn, cuttings will do pegged down close to the surface, which should have been put into shape with the rake, and made firm by beating with the spade, the same as is done with Box edging; only instead of opening a trench as for Box, the cuttings, which should

be about 6 inches long, are dibbled in in rows and pegged down immediately, close to the surface of the ground.

CHAPTER XIV

Propagation of Bedding Plants.—The usual way of securing a stock of tender exotics for the flower garden, such as Pelargoniums, Verbenas, etc., is to put in the bulk of the cuttings in August. All the Pelargonium family strike best in the open air fully exposed to the sun, but the thinner they are placed the stouter and hardier the little plants are, and the less mortality there is among them in the ensuing winter. I have rooted the cuttings in small single pots, in store pots—ten or so in a pot, also in boxes, and have dibbled them in the open border, and they may be successfully managed in all or any of these several ways ; but individual circumstances must guide and control us in this matter. I will only observe, further, that the more the plants are exposed to the sunshine and air, the better they will go through the dark days of winter. Sandy loam should form the great bulk of the soil for striking the cuttings in, and they may remain in the open air as long as they can do so with safety. Some people place the cuttings of the delicate variegated Pelargoniums in frames under the shelter of glass ; but years ago, when I grew these things largely, I tried every plan that suggested itself to me for increasing them rapidly, and no plan succeeded so well as dibbling them thinly in a warm, south border, in the full sunshine, in August, never to shade, and to give but little water, potting them into 2½-inch pots as soon as they were rooted, and wintering them on shelves close to the glass in a dry, rather cool house. The same treatment will suit all the Geranium family, and by no other plan can such nice sturdy plants be obtained ; but then we are all the victims of circumstances, more or less, and we must cut our garment according to our cloth. Verbenas and all other soft plants (Pelargoniums excepted) will succeed best in a close frame without artificial heat, as in August, by keeping the frame close and utilising the sun's warmth, a genial temperature will be obtained. The only thing to guard against is damp arising from a stagnant atmosphere, and the best way to obviate this is to ventilate freely early in the morning, say from six to nine or ten o'clock, and then, as the sun's power is making visible effect, close the frame and put on a light shade. The watering, when it is necessary, should be done in the morning. In this way, pretty well, every sound healthy cutting will root. In autumn propagation it is customary to use rather larger cuttings

than in spring, as at that time, when the cuttings are plentiful, we have the power of selection, and should take none to stand the winter but those full of healthy vigour. In the spring propagation artificial heat is necessary, and, where large numbers are required, a properly constructed propagating house is desirable, and the best I ever had was a low span-roofed structure partly sunk in the ground, fitted with a wrought-iron tank on one side in direct connection with the boiler. The tank was covered with slates, and on the slates was the plunging material, partly sand and partly Cocoa-fibre, the latter substance being specially suitable for things that required rather more time than *Verbenas* and ordinary bedding stuff. But where only a limited number of plants are required to be rooted in spring for the flower garden, and the usual order of soft-wooded plants for greenhouse, such as *Fuchsias*, etc., a hotbed and frame will answer every purpose, and if it commands a bottom heat of 75° it will meet every requirement.

The month of March is a good time to begin propagating, as by that time plenty of nice fresh shoots can be obtained to form cuttings, and the fresher and softer they are the better they will root. The cuttings need not be large, as in spring the growth is rapid, and every bit will strike; but granting all this, still the stronger and healthier the cuttings, the better and more vigorous the plants will be as a rule. I have often, in the case of new things, pushed them severely, with the view of increasing stock rapidly; but when this forcing process is carried to extremes, debility is often present in the offspring. The soil for spring propagating should be light and sandy, and pressed firmly in the pots. Bedding plants may be propagated in spring in a wholesale way by just dibbling the cuttings into beds of soil placed over a gentle hotbed under frames. The cuttings will root in a week, and in the second week the tops may be taken off and planted in another frame which is coming on in succession; and when a sufficient stock has been created, the whole can be hardened off by removal of the glass in the daytime, and about the third week in May the plants can be carefully separated and planted into the beds and borders. This is a very inexpensive way of raising large numbers of plants, and they will commonly succeed better in the beds than those that have been starved and pinched in pots.

Wintering Bedding Plants.—Light, well-ventilated houses are best for wintering plants which only require to be preserved from frost and damp, and the nearer the glass the stages and shelves are the better. In mild calm weather, it is hardly possible to give too much air, and only sufficient fire must be used to keep out frost. A boiler and hot-water pipes are usually recommended for

safety and cleanliness, but for a house where only a fire is required occasionally, a flue is not to be despised. I know several little houses that are only required to keep out the frost in winter, where a flue gives every satisfaction and is cheaper than a boiler and pipes would be, as it burns up all the cinders and refuse from the woodyard and house. In the management of bedding plants in winter, dead leaves on the plants, or Moss and weeds in pots, must have no existence, as cleanliness is just as important to the health of plants as it is to human beings. The plants during the short days must be kept on the side of dryness at the root, rather than wet; yet, at the same time, they must not suffer from drought, and whenever water is required give enough to moisten all the soil.

CHAPTER XV

Hardy Border Plants.—With the fastly-growing taste for hardy flowers, some better way of arranging and disposing them will probably be found than was common in olden times; at any rate, considering the strides gardening has made during the last forty years, it is certain the old-fashioned mixed border will not satisfy all of us now—nor need it, for hardy plants are capable of being formed into an infinite variety of combinations. We may create bold masses of particular plants in suitable situations—such, for instance, as the Foxgloves on the hillside, the Pampas Grass by the water's edge, the Clematis hanging over the cliff, or rambling over an arch or arbour. Jackmanni and its hybrids are specially effective in a good-sized mass in summer. Nearly every kind of plant when gathered into masses or clumps has a different effect to what it has when dotted about singly. Of course I do not say the massing system should be always and everywhere adopted; what I plead for is variety, and sometimes, instead of frittering our space and material away in mixtures that are tame and meaningless, it would be an advantage to gather them together for a bold *coup*.

For the arrangement of a border or collection of hardy plants we need not tie ourselves down to any one system. If several borders have to be planted, arrange the plants differently in each. Monotony may creep into a garden of hardy plants, just as easily as it used to do into a garden of Geraniums. There are certain plants of spiral habit, such as the Delphiniums, for instance, which seem specially adapted for dotting about amid dwarf-spreading plants, as each plant in itself is a complete picture, and seeks for a contrasting rather than a harmonising *vis-à-vis*. Still, even in the case of these plants, for the sake of variety, half a dozen or so

of the different shades of colour may appropriately fit into backgrounds with the happiest effect. I am offering suggestions rather than laying down rules. I want my readers to think out their own case, with a view to making the most of the rich materials which lie ready to our hands; and let no one suppose that hardy plants can be cultivated without trouble. Many of the best and choicest things will leave us if we forget or neglect them. I know from my own experience, and the study of different arrangements, that a great deal more may be done than has been attempted in most places, where hardy plants are ousting the bedding system again. It is the custom to call them old English flowers, and though they had in the last century, and probably many centuries before, beautiful gardens—for in all ages one of the first things man has done when light has dawned upon him has been to plant a garden—yet it is certain the ancients had no such collections of hardy plants as are now waiting for our use. And this being so, it is all the more incumbent on us to make a good use of border plants, displaying them in various ways. Individual tastes and desires will, of course, have to be considered, for every owner of a garden ought to make his presence felt in it. And if he wishes to grow plants for the purpose of study only, then he will adopt the botanical system of arrangement, grouping them in families, keeping each species separate. Where a really first-rate collection of hardy plants is grown, it is a good plan to have duplicates of the best and choicest things arranged in this fashion in the reserve garden, where they will be always under the eye. Many a choice thing is completely lost through having all the stock planted thickly for effect in the mixed border, or in some conspicuous situation where bare earth would not be tolerated. In planting the herbaceous border, the usual arrangement is to plant the tallest at the back, and then follow with a row a size shorter, and so on till the front is reached.

I do not find any fault with this arrangement. It is in itself excellent, but it does in time become monotonous; and if we had more than one border to plant I should say discard the mathematical arrangement and let them break their ranks a little, some of the tall plants coming down towards the front, and others of the low-growing creeping plants retire up the border to the shade and seclusion there afforded them. I have tried this plan, and I can assure my readers the effect is not lost, and the ground is better covered when the tall and short plants are permitted to blend, as they often do in nature. Of course no rules can be laid down for planting a border of this kind. Each planter must use his own taste and judgment, and it is wonderful how interesting

it may become, and what a number of combinations well thought out, though seemingly careless in their arrangement, may be had in one short border. Then there will, as we break more and more away from the tender exotics, be found plenty of hardy plants for grouping on the lawn, both in formal beds, if they are desired, and also for informal patches or large masses on the turf. The collection of hardy plants should be named correctly, for the special behoof of visitors if not for our own convenience. The plan common in gardens, many years ago, of growing duplicates of all the choicest things in a border by themselves, where they could be set out separately and named, so that those who ran could read, was an excellent one for the purpose of study, as well as to secure stock of delicate kinds, which are often lost in a crowded border. In the select lists which are given below, I will endeavour to distinguish any which I think have special qualifications by a word or two of comment as I proceed, and, as far as I can, will give the height, colour of flower, and season of flowering.

Hardy Flowers for Spring.—*Aubrietia grandiflora*, purple, 9 inches; *Adonis vernalis*, yellow, 12 inches; *Acorus gramineus*, yellow, 6 inches; *Æthionema cordifolium*, rose, 8 inches; *Alyssum saxatile*, yellow, 9 inches; *Allium Moly*, yellow, 12 inches; *A. neapolitanum*, white, 18 inches; *Anemone apennina*, blue, 9 inches; *A. coronaria*, various, 9 inches; *A. blanda*, blue, 8 inches; *A. fulgens*, scarlet, 9 inches; *A. nemorosa fl.-pl.*, white, 6 inches; *A. Pavonina*, crimson, 12 inches; *A. sylvestris*, white, 18 inches. The *Anemones* are more sought after than they were, but are not half so much grown as they should be. *Arabis albida*, white, 6 inches; *A. lucida variegata*, white, 8 inches; *Cardamine pratensis fl.-pl.*, white, 9 inches; *Campanula rotundifolia*, blue, 24 inches; *Caltha palustris fl.-pl.*, yellow, 9 inches (damp soil); *Cheiranthus Cheiri*, various, 15 inches; *C. alpinus*, yellow, 12 inches. All the *Wallflowers* are sweet and beautiful, and thrive under the simplest culture. *Chionodoxa Luciliæ*, blue, 3 inches; *Convallaria majalis*, white, 6 inches; *C. bifolia*, white (*Lily of the Valley*), 3 inches; *Corydalis solida*, rose, 6 inches; *C. lutea*, yellow, 15 inches. The *Crocus* and *Cyclamen* have been referred to under the heading of "*Hardy Bulbs*," so need not be specially mentioned here, but no more showy or brighter spring flowers are in existence. *Dielytra spectabilis*, rose and yellow, 30 inches; *Dentaria digitata*, purple, 10 inches (damp situation); *Dodecatheon Meadia* (*American Cow-slip*), purple, 12 inches; *D. integrifolium*, crimson, 6 inches; *D. Jeffreyanum*, purple, 18 inches; *Doronicum austriacum*, yellow, 15 inches; *Dracocephalum alpinum* yellow, 9 inches; *Epimedium pinnatum elegans*, yellow, 12 inches; *E. diphyllum*, white, 6

inches. All the Barrenworts are pretty, and should have sandy peat. *Erica carnea*, purple, 9 inches; *E. mediterranea*, purple, 30 inches; *Fritillaria imperialis* (Crown Imperial), various, 36 inches; *F. Meleagris*, various, 18 inches; *F. præcox*, white, 12 inches; *Gentiana verna*, blue, 2 inches (moist deep loam); *Glechoma hederacea* (fol. var.), blue, 4 inches; *Helleborus niger* (Christmas Rose), white, 9 inches; *H. atrorubens*, purple, 15 inches; *H. guttatus*, rose, 12 inches; *H. orientalis*, rose, 12 inches; *Hepatica triloba*, various, 4 inches; *H. angulosa*, blue, 9 inches; *Hedysarum obscurum*, rosy purple, 9 inches; *Iberis sempervirens*, white, 9 inches; *I. gibraltarica*, white, 15 inches; *I. corifolia*, white, 6 inches; *I. saxatilis*, white, 9 inches; *Iris germanica*, various, 2 feet; *I. cristata*, purple, 6 inches; *I. florentina*, white, 20 inches; *I. pumila*, violet, 4 inches; *I. reticulata*, violet, 6 inches. The whole family of Irises are very lovely, and very easy of culture in any good garden soil. *I. reticulata* is worthy a place on the select rockwork, and should have a little peat. *Lunaria biennis* (Honesty), purple, 30 inches; *Muscari botryoides* (Grape Hyacinth), blue, 9 inches; *Narcissus* in great variety; *Myosotis dissitiflora*, blue, 6 inches; *M. montana*, blue, 12 inches; *Orobis lathyroides*, blue, 30 inches; *O. vernus*, purple, 12 inches; *Ornithogalum umbellatum*, white, 9 inches; *Papaver nudicaule*, yellow, 12 inches; *Primulas* in great variety; *Ranunculus alpestris*, white, 4 inches; *R. amplexicaulis*, white, 6 inches; *R. montanus*, yellow, 6 inches; *Scilla amœna*, blue, 9 inches; *S. bifolia*, blue, 8 inches; *S. sibirica*, blue, 4 inches; *S. præcox*, blue, 6 inches; *S. verna*, blue and white, 6 inches; *S. peruviana*, blue, 12 inches; *S. alba*, white, 12 inches; *S. italica*, blue, 9 inches. This delightful race of dwarf bulbous-rooted plants should not be transplanted often—excellent for margins of borders, or for low masses where nothing else will encroach upon them. Plant in October, 3 inches deep. If the soil is cold and heavy, lighten it with leaf-mould and road-scrappings. *Saxifraga granulata* fl.-pl., white, 9 inches; *S. pyramidalis*, white, 12 inches; *S. umbrosa* (London Pride), 12 inches; *S. cordifolia*, rose, 9 inches; *S. Wallacei*, white, 9 inches; *S. crassifolia*, red, 9 inches; *S. oppositifolia*, purple, 3 inches; *S. Burseriana*, white, 3 inches. This list may be much increased. The Saxifrages are well adapted for covering the rockery. *Sisyrinchium convolutum*, yellow, 6 inches; *S. grandiflorum*, purple, 9 inches. The Satin Flowers are exceedingly pretty, and require light sandy soil, in a sunny sheltered border. *Thalictrum anemonoides*, white, 6 inches; *Trillium grandiflorum* (Great Wood Lily), white, 12 inches (damp peat bog); *Triteleia uniflora* (Spring Star Flower), white, 6 inches (rockery, or some warm, elevated site).

Hardy Flowers for Summer.—*Acæna microphylla*, crimson, 2 inches, very pretty low plant of mossy growth, suitable for a dry bank; *A. pinnatifida*, purple, 12 inches; *Acanthus mollis*, rose, 3 feet; *A. latifolius*, rose, 4 feet, very handsome plant, quite distinct feature, good either for grouping or isolation; *Achillea Ptarmica* fl.-pl., white, 18 inches; *Aconitum chinense*, blue, 5 feet; *A. japonicum*, blue, 3 feet. The Monkshoods are a very handsome race, but somewhat dangerously poisonous, especially the common form. *Agapanthus umbellatus* (blue African Lily), 2 feet, warm sheltered border; *Agrostemma coronaria* (Rose Campian), crimson, 18 inches; *A. Flos-Jovis* (Flower of Jove), purple, 18 inches; *Allium azureum*, blue, 18 inches; *A. fragrans*, white, 15 inches; *Alstroemeria aurantiaca*, orange, 3 feet; *A. chilensis*, red, $2\frac{1}{2}$ feet; *A. versicolor*, various, 6 inches. An exceedingly handsome group of bulbous plants of the *Amaryllis* order, flowering for a long period, should be planted 8 inches deep in good soil, and not afterwards disturbed. *Anchusa italica*, blue, 30 inches; *Antennaria tomentosa*, white, 8 inches; *A. margaritacea*, yellow and white, 18 inches; *Antirrhinum* (Snapdragon) *majus*, various, 18 inches.

The Snapdragons are a very interesting and useful family, well known for their power of adapting themselves to all circumstances as regards soil and situation. *Anthericum Liliastrum* (St. Bruno's Lily), white, 18 inches; *Anthyllis montana*, pink, 6 inches; *Aquilegia cærulea* (Columbines), blue, 12 inches; *A. glandulosa*, blue, 12 inches. The Columbines are among the most interesting border plants, easily raised from seeds, which frequently scatter and grow under suitable conditions without the cultivator's aid. *Argemone grandiflora* (Mexican Poppy), white, $2\frac{1}{2}$ feet; *Armeria cephalotes rubra* (Large Thrift), rose, 12 inches; *Asclepias incarnata*, red, 18 inches; *Asphodelus luteus*, yellow, 3 feet; *A. ramosus*, white, $3\frac{1}{2}$ feet; *Astilbe barbata*, white, 12 inches; *A. rivularis*, yellow, 3 feet; *Astragalus stipulatus*, purple, 30 inches; *Baptista australis*, blue, 18 inches; *Betonica grandiflora*, purple, 15 inches; *Bocconia cordata* (Celandine Tree), 5 feet; *Calandrinia umbellata*, crimson, 4 inches, sandy soil; *Calystegia pubescens*, fl.-pl., pink, 5 feet, has climbing habit, beautiful plant to cover a low trellis; *Campanula carpatia*, blue and white, 12 inches; *C. grandis*, blue, 24 inches; *C. macrantha*, blue, 3 feet; *C. persicifolia alba pleno*, white, $2\frac{1}{2}$ feet; *C. pyramidalis*, blue, 4 feet; *C. rotundifolia*, blue, 2 feet; *C. pulla*, purple, 4 inches. The Bell flowers are very numerous; the above selection comprises some of the most beautiful; deep sandy loam suits them well. *Catananche bicolor*, blue, 18 inches; *C. cærulea*, blue, 18 inches; *Centaurea*

babylonica, yellow, 4 feet; *C. montana*, blue, 18 inches; *C. dealbata*, rose, 15 inches. The *Centaureas* are most useful border plants, requiring no special care. *Centranthus ruber*, red, 2 feet; *Chelone obliqua*, purple, 2½ feet; *Chrysocoma Lynosyris* (Golden Locks), yellow, 18 inches; *Cineraria macrophylla*, yellow, 3 feet; *Coreopsis lanceolata*, yellow, 2 feet; *C. grandiflora*, yellow, 3 feet; *Corydalis lutea*, yellow, 15 inches; *Crinum capense*, white, 2 feet; *C. roseum*, rose, 2 feet. The Cape Lilies require deep, rich soil, and plenty of water in summer. *Delphinium elatum*, blue, 4 feet; *D. formosum*, blue, 2 feet; *D. grandiflorum*, blue, 2 feet; *D. Hendersoni*, light blue, 3 feet; *D. belladonna*, azure, 3 feet; *D. intermedium*, blue, 5 feet; *D. Cambria*, blue, 3 feet; *D. ranunculiflorum*, double purple, 4 feet; *D. nudicaule*, scarlet, 12 inches; *Dictamnus Fraxinella*, purple, 2 feet; *Dianthus barbatus* (Sweet William), *D. Caryophyllus* (Clove Carnation).

All the *Dianthus* (Pink) family are beautiful, and many of them are quite indispensable for cut flowers. For backgrounds, or in the shrubbery, or for creating masses of colour on the higher places in the rockery, or in the wild garden, Foxgloves are worthy of a place; some of the forms are prettily spotted. *Dracocephalum grandiflorum*, blue, 8 inches; *Echinacea intermedia*, purple, 2 feet; *Erigeron speciosus*, blue, 2 feet; *Echinops Ritro*, blue, 18 inches; *Erodium carvifolium* (Heron's bill), red, 9 inches; *E. hymenodes*, pink, 12 inches; *Eryngium amethystinum*, 2 feet; *E. giganteum*, blue, 3 feet; *Funkia cærulea* (Plantain Lily), blue, 18 inches; *F. japonica*, white, 12 inches; *F. Sieboldi*, lilac, 12 inches; *F. ovata*, puce, 9 inches; *F. lancifolia*, puce, 9 inches; *F. grandiflora*, white, 12 inches. These are splendid border plants, having grand—in some instances variegated—foliage and beautiful Lily-like flowers; may be effectively grouped on the grass or elsewhere. *Gaillardia aristata*, yellow, 2½ feet; *G. Drummondii*, red, 18 inches; *G. Loisei*, orange, 15 inches; *Galega officinalis* (Goats' Rue), white and purple, 3 feet; *Gentiana acaulis*, blue, 4 inches, damp deep loam; *Geranium cinereum* (Cranesbills), red, 8 inches; *G. ibericum*, violet, 9 inches; *G. pratense fl.-pl.*, blue, 18 inches; *G. sanguineum*, red, 12 inches; *G. striatum*, striped, 12 inches. The *Geraniums* are among the best border plants, giving satisfaction without causing much trouble. *Geum coccineum plenum*, scarlet, 18 inches; *G. chilense*, scarlet, 2 feet; the double scarlet is very useful for cutting. *Gladiolus communis*, rose, 18 inches; *Gynerium argenteum* (Pampas Grass), white, 9 feet; *Gunnera scabra*, 4 feet; the two last named are very striking plants. *Gypsophila paniculata*, white, 2½ feet, fine for cutting from; *Hedysarum coronarium* (French Honeysuckle), red, 3 feet; *Harpalium rigidum*, *Helianthus multiflorum plenus*

(perennial Sunflowers), yellow, 4 feet ; *Hemerocallis flava* (Day Lily), yellow, 2 feet ; *H. disticha* fl.-pl., orange, 18 inches ; *Hesperis matronalis* (Rocket), various, 18 inches ; *Hyacinthus candicans*, white, 2 feet ; *Heuchera glabra*, purple, 12 inches ; *Hypericum calycinum*, yellow, 12 inches, specially useful for shady places where other plants do not thrive. *Iris flavescens*, yellow, 2 feet ; *I. florentina*, white, 2 feet ; *I. nudicaulis*, violet, 9 inches ; *I. sibirica*, blue, 2 feet ; *I. variegata*, striped, 2 feet ; *I. xiphioides*, blue, 18 inches ; *Lathyrus californicus*, lilac, 2½ feet ; *L. grandiflorus* (Everlasting Pea), rose, 4 feet ; *L. latifolius*, rose, 4 feet ; *L. alba*, white, 3 feet.

The Everlasting Peas are very showy and useful for covering low walls or training up stems of trees. *Liatris elegans*, purple, 2½ feet ; *L. spicata*, purple, 3 feet ; *Lilium colchicum*, lemon, 4 feet ; *L. excelsum*, cream, 4 feet ; *L. longiflorum*, white, 2 feet ; *L. chalcedonicum*, scarlet, 3 feet ; *L. auratum*, striped, 4 feet ; *L. candidum*, white, 3 feet ; *L. croceum*, orange, 2½ feet ; *L. Martagon*, purple, 2 feet ; *L. speciosum*, carmine, 2 feet ; *L. tigrinum*, scarlet, 2½ feet ; *L. Browni*, white, 3½ feet ; *L. Washingtonianum*, white, 5 feet. Though the list of Lilies may be increased indefinitely, so numerous are they, those named above will do to start with. A deep loamy soil suits them best, and for all the species here mentioned it should be well drained. Plant not less than 8 inches deep, and transplant when necessary soon after the flowering period is over in autumn. *Linum flavum*, yellow, 12 inches ; *Lupinus polyphyllus*, blue, 3 feet ; *Lythrum roseum superbum*, rose, 2 feet ; *Lobelia syphilitica*, blue, 2 feet ; *L. cardinalis*, scarlet, 2 feet, a grand plant, should have protection in winter ; *Lychnis chalcedonica*, scarlet, 18 inches ; *Malva moschata alba*, white, 2½ feet ; *M. Moreni*, rose, 2½ feet ; *Mimulus luteus*, yellow, 9 inches ; *M. guttatus*, yellow, 12 inches, moist situation only ; *Monarda didyma*, red, 2 feet ; *M. purpurea*, purple, 2 feet ; *Oenothera fruticosa*, yellow, 2½ feet ; *O. macrocarpa*, yellow, 9 inches ; *O. speciosa*, white, 18 inches. The Evening Primroses are a beautiful race of plants. *Onosma taurica*, yellow, 9 inches ; *Pæonia albiflora*, white, 2 feet ; *P. officinalis*, crimson, 2½ feet. The Pæonies are all grand plants, and can be had in many varieties. *Panicum altissimum*, red, 5 feet, beautiful grass, deep, warm, loamy soil ; *Papaver orientale*, scarlet, 2½ feet ; *P. pilosum*, orange, 18 inches ; *Pentstemon gentianoides*, purple, 2 feet ; *P. barbatus*, scarlet, 2½ feet ; *P. procerus*, blue, 12 inches ; *P. Digitalis*, white, 15 inches.

The gentianoide group has been elevated into florists' flowers, and has assumed large proportions specially worthy of cultivation. *Phalaris arundinacea variegata*, striped canary grass, white, 2 feet ;

Phlox decussata, various, 3 feet to 4 feet, a much improved family, very showy, and good under good cultivation; *Polemonium cæruleum* (Jacob's ladder), blue, 2 feet; *Polygonatum multiflorum* (Solomon's Seal), white, 2 feet; *Polygonum Sieboldi*, white, 3 feet; *P. cuspidatum*, white, 5 feet; *P. filiforme* (fol. var.), rose, 2 feet. Very striking plants, blooming late in summer and autumn, *Potentilla formosa*, red, 18 inches; *P. splendens*, yellow, 12 inches; *P. atrosanguinea*, crimson, 18 inches. The *Potentillas* or "Cinque-foils"—to use their English cognomen—are all beautiful border and rockery plants, the varieties of the last named (*atrosanguinea*) being specially worthy of notice. The double varieties of *Potentilla* are also very beautiful. All, both double and single, are easily raised from seeds. *Pyrethrum uliginosum*, white, 4 feet; *P. roseum* (single and double), in great variety, which is annually increasing, height 2 feet, splendid bed and border plants, and fine for cutting. *Ranunculus acris flore-pleno* (double Buttercup), yellow, 12 inches; *R. amplexicaulis*, white, 6 inches. All the Buttercup family require moist soil; *R. asiaticus* (florist *Ranunculus*), various, 9 inches. *Rudbeckia speciosa*, orange, 2 feet; *R. Drummondii*, yellow, 2 feet; *R. Newmanii*, yellow, 4 feet; *R. hirta*, yellow, $2\frac{1}{2}$ feet; *Saxifraga Aizoon*, crimson, 9 inches; *S. Cotyledon*, white, 15 inches; *Scabiosa caucasica*, blue, 2 feet; *S. ochroleuca*, yellow, 12 inches; *Senecio Doronicum*, yellow, 12 inches; *S. japonicus*, yellow, 4 feet; *Spiræa Aruncus*, white, 4 feet; *S. Filipendula pleno*, white, 18 inches; *S. palmata*, carmine, 2 feet; *S. venusta*, rose, $2\frac{1}{2}$ feet; *S. Ulmaria flore-pleno*, white, 20 inches; *Statice latifolia*, blue, $2\frac{1}{2}$ feet; *S. speciosa*, rose, 18 inches; *Stenactis Aruncus*, white, 3 feet; *Stenactis speciosa*, purple, 2 feet; *Symphytum caasicum*, blue, 18 inches; *Thalictrum minus*, green, 12 inches, foliage useful for cutting; *T. Lyalli*, a shrubby species from New Zealand, *Tradescantia virginica*, violet, 15 inches; *Tradescantia alba*, white, 15 inches; *T. rubra flore-pleno*, red, 15 inches; *Tritoma Uvaria glaucescens*, red, 3 feet; *Trollius asiaticus*, yellow, 12 inches; *T. napellifolius*, yellow, 12 inches; *Veratrum album*, green, $3\frac{1}{2}$ feet; *V. nigrum*, black, 3 feet. The white and black *Hellebores* are striking plants, of noble aspect, and in strong soil attain large proportions. *Veronica amethystina*, blue, 18 inches; *V. austriaca*, blue, 12 inches; *V. gentianoides*, blue, 18 inches; *V. saxatilis*, blue, 6 inches; *V. corymbosa*, blue, 18 inches; *V. Teucrium*, light blue, 2 feet; *V. longifolia* (var. *Subsessilis*), a grand species from Japan, blue, 2 feet; *V. incana*, blue, 9 inches, this plant has white downy foliage, useful for edgings; *V. candida*, light blue, 12 inches; *Yucca filamentosa*, white, $2\frac{1}{2}$ feet; *Y. gloriosa*, white, 4 feet; *Y. recurva*, white, 3 feet.

Hardy Flowers for Autumn.—*Anemone japonica rubra*, rose, $2\frac{1}{2}$ feet ; *A. j. Honorine Joubert*, white, $2\frac{1}{2}$ feet ; *Aster coccineus*, red, $3\frac{1}{2}$ feet ; *A. dumosus*, white, 1 foot ; *A. elegans*, purple, $2\frac{1}{2}$ feet ; *A. fragilis*, white, 2 feet ; *A. lævis*, purple, 2 feet ; *A. multiflorus*, white, 2 feet ; *A. Novæ-Angliæ*, blue, 4 feet ; *A. Novi-Belgi*, blue, 4 feet ; *A. obliqua*, purple, 4 feet ; *A. amellus*, purple, 2 feet ; *A. bessarabicus*, violet, 2 feet ; *A. versicolor*, white and pink, 1 foot. The Starworts, or Michaelmas Daisies, as they are sometimes called, are a very numerous and interesting family, and their late blooming enhances their value.

Helenium autumnale, yellow, $2\frac{1}{2}$ feet ; *Helianthus multiflorus*, yellow, 3 feet ; *H. orgyalis*, yellow, 6 feet ; *Helichrysum Stœchas*, yellow, 18 inches ; *Inula glandulosa*, yellow, 2 feet ; *Leucojum autumnale* (autumn Snowflake), white, 4 inches ; *Oxalis Bowiciana*, rose, 9 inches, must have a warm, dry situation ; *Petasites fragrans* (winter Heliotrope), gray, 12 inches ; *Physalis Alkekengi* (winter Cherry), scarlet fruit, very brilliant, 12 inches ; *Physostegia imbricata*, purple, 3 feet ; *Plumbago Larpentæ*, blue, 15 inches ; *Schizostylis coccinea*, crimson, 2 feet, a very beautiful autumn-flowering plant, may be lifted and placed in pots for the conservatory, where the flowers will be fresher and nicer ; *Sedum spectabile*, pink, 12 inches ; *Senecio pulcher*, crimson, $2\frac{1}{2}$ feet ; *Silene Schafta*, purple, 6 inches ; *Solidago grandiflora* (Golden Rod), yellow, 3 feet ; *Statice angustifolia*, lilac, 12 inches ; *Sternbergia lutea*, yellow, 6 inches ; *Tritoma Burchelli* (Flame Flower), scarlet, 3 feet ; *T. Uvaria*, red, 3 feet ; *T. grandis*, red and orange, 5 feet.

The list of autumn flowers is not an extensive one ; but many of the summer-flowering plants virtually flower in autumn, as they continue to put forth blossoms till the frost comes. To these must be added the *Chrysanthemums*, although they are now classed with the florists' flowers, and will be referred to hereafter. Still, when treated merely as border plants in a mild autumn, they brighten up many a little garden—ay, and many a great one—in November ; and if planted against a low wall or amid the shelter of shrubs, *Chrysanthemums* will yield a good many blossoms with but little trouble.

Hardy Flowers for Cutting.—This is one of their strongest points. One might possess miles of ribbon borders, and yet be unable to fill a vase decently ; but with a good collection of hardy plants in the borders we can gather flowers of all the most beautiful colours, and of the most graceful habit of growth, and, what is often of great importance, we may have them of any length of stalk. From the time of the Violets and Snowdrops in winter, through the Primrose season and the time of Lilies, something or other is always coming on till the season of Violets is met in the

autumn again. To have Violets in abundance should be the aim of all ; and if we do not want to gather them, they will fill the air with fragrance. To this end they should be planted freely, filling up spare corners in the shrubbery border, even beneath the shrubs if the shade is not too dense. The common Russian is quite at home in such positions ; but Violets that have become naturalised, so to speak, in the shrubbery, do not flower so early, nor are their flower stems so long, as the cultivated plants ; and this latter point, where the flowers have to be gathered and tied in bunches, is an important one. For producing a large quantity of blossom in autumn and winter, frequent renewal is necessary. In no case should the plants be permitted to occupy the same site more than two years, and the best plan is to raise a lot of young ones annually, especially all that are required for plotting or placing in frames. The side shoots pegged down in April, and a little fine light soil scattered over the runners, will produce quickly any number of plants, which should be lifted and planted in beds till the autumn. A friend who grows Violets largely has a low long pit, which he fills with plants raised in this way lifted from the borders in autumn, and from which immense quantities of fine blossoms are gathered all the winter. There is a hot-water pipe along the front of the pit, which is a great help in wet or cold weather, as even Violets enjoy a genial warmth when opening their blossoms. The best varieties for forcing are the single Neapolitan and the double Marie Louise. The coloured Primroses, again, are nice to gather for the rooms in winter, and we find that by transplanting and dividing the roots frequently they become more precocious—more perpetual in their habit of blooming. A position in the full sunshine is not a good one for any of this sweet retiring family ; indeed, their home in the woods or in the thick hedge bottoms would suggest as much. Polyanthus and alpine Auriculas are very sweet for picking in early spring, and are easily raised from seeds or by division. Another race of plants which are indispensable for cutting early in the season is the Anemones. The double scarlet is a grand plant to be grown in large beds for its flowers alone, and it travels and keeps its petals for so long a time. Whilst many of the hothouse flowers, about which so much fuss is made, perish in a few hours, the Anemones will last days, and if gathered before the blooms are quite open they will last more than a week—by changing the water occasionally, or keeping a few bits of animal charcoal in the vase. The varieties of *Anemone coronaria* are also beautiful for cutting, and on a warm border they flower with us all the winter. Seeds gathered from the best flowers and sown in spring germinate

quickly in the open border, or they may be sown in the frame and transplanted when large enough.

The Columbines are nice for cutting, and in a cool house in pots they flower early; the hybrid forms are very pretty. All the Asters or Starworts are useful for cutting, and they come at a season when flowers are becoming scarce; the same may be said of the autumn Anemones or Japan Windflowers. The Canterbury Bells are delightful for filling large vases in the hall, and these, too, are easily raised from seeds; they are biennials, and should be sown in April for flowering the following year. There are also the Delphiniums, the Pyrethrums, the double scarlet Geum, all the Irises, and the Everlasting Peas (*Lathyrus*). What grand things the Pæonies are for effect in a large vase, in a corridor or hall, mixed with plenty of foliage! Indeed, in making a large provision for cut blossoms, foliage must not be neglected. Cut spikes of the old white Lily (*candidum*), looking out of a base of green leaves, have a splendid appearance. The Spiræas and Veronicas are useful for this purpose, as are also the Poppies, both perennial and annual forms.

The perennial Sunflowers, especially the double form of *Helianthus multiflorus*, the Phloxes, Rudbeckias, Funkias, Senecios, Statice, *Coreopsis*, *Gypsophila*s, and the spotted Foxgloves, are all valuable, when cut, for some of the various purposes for which cut flowers are now employed. Then the *Dianthus* family are a host in themselves; the Carnation, Picotee, Pink, and Sweet William are indispensable. The blossoms of *Pentstemon* and *Antirrhinum*, though lacking fragrance, are not without value as cut flowers. The Grasses, both the flowers and foliage, add a grace and charm to bouquet and vase which nothing else can give. All plants which produce handsome foliage should have at least some of the leaves cut to mix with the flowers in setting them up. Though there is still much room for improvement, yet cut flowers are arranged in a better and more natural manner than was common only a few years ago. With many people the great aim apparently was to get as much into the vases as possible, instead of showing every flower off to the best advantage. How unhappy it makes one feel to see a lot of beautiful flowers (Nature's sweetest productions) tied up in a bundle and thrust into a vessel of water, with their crushed and damaged blossoms all too conspicuous! It is impossible for any person of taste to enjoy flowers treated in this way. Half a dozen sprays of blossom, in two or three varieties, looking out from amid a mass of greenery, will be more effective, and give more real pleasure, than when overcrowded—the flowers ever so costly or rare. A good collection of hardy

plants may be grown in a comparatively small space, although, of course, it is better not to limit ourselves in room, as sites may be created for grand masses of some special subject standing alone in some nook or corner, imparting a character to the place which is not soon forgotten.

CHAPTER XVI

The Propagation of Hardy Plants.—This may be effected by cuttings of branches or roots, by division, and by seeds. As regards the propagation by cuttings, the best time to take these, when the generation takes place in the open air, is in July and August. If glass is used the propagation may be either earlier or later. It is always advisable, even in the simplest kind of propagation, to prepare the bed before inserting the cuttings. The best plan is to place on the surface of the ground (selecting a shady site, or a situation where the rays of the midday sun do not penetrate) 4 inches in depth of nice, light, sandy compost, that has been run through a half-inch sieve. Make it firm by pressure; if dry, soak well with water, and when the surplus moisture has drained away dibble in the cuttings. If the compost is not to be had for the surface-dressing, pass the top 3 inches of the border through the half-inch sieve; the thorough intermingling and breaking up which this effects will be an advantage to the cuttings, causing them to root better and more rapidly.

If the bed is ready, the cuttings can be taken a few at a time when they can be obtained. Of course young shoots, destitute of flowers, make the best cuttings, but very often these cannot be had; and if flowering stems have to be employed, it is better not to wait till the advancing seeds have taken all the vigour out of the plants. The flower stems of many things cut into pieces several inches in length, so as to include two or more joints, will make excellent cuttings, and in some cases—as with Hollyhocks, for instance—a single joint is sufficient to make a plant. The propagation of plants under glass may go on pretty well all the year round, and I shall refer to this hereafter. Propagation by division is the simplest of all. We have only to dig up a root at a season when the plant is not in flower or approaching that condition, and separate it into as many pieces as we have plants for, each with a root or two attached. The tool required for the work is a sharp knife. Very frequently, in the case of common things, the spade, if a good steel implement, will perform the operation in a satisfactory manner, but with choice things it

may sometimes be necessary to have a pail of water ; dip the ball of earth in the water, to dislodge some of the soil and show where the division may be effected with the least injury to the plants. Either in the spring or the autumn plants may be divided, and indeed it is not advisable to lay down any particularly narrow line, for if the plants are not actually in blossom they can be divided any time in the early summer with perfect success. If it is desirable to divide any plant into small pieces for the purpose of increasing stock, the offsets should be treated as cuttings, and planted for a season in the reserve garden.

Propagation by Seeds.—Many of the best hardy perennials may be raised from seeds, and there is a great and interesting field for thought and study open to the man or woman of enthusiastic temperament in the raising of plants from seeds, especially where time can be given to the fertilising and crossing of various families. Man has just the same influence over the destiny of the plants he cultivates as he has over the animals he feeds, provided he possesses the necessary time and patience to think and work the matter out, and can bear disappointment without swerving from what he has set himself to do. Nearly all seeds germinate best when new, and a larger proportion of seeds will produce plants if they are sown as soon as ripe than if kept till spring, which is the orthodox time for seed sowing. Assuming that seeds which ripen in July and August, or even up to the middle of September, were sown as soon as they ripen, a season would be gained over putting them into bags or packets till spring. Seeds of perennials sown in August will germinate and be strong enough to stand the winter, and in the spring will be little plants ready to begin work. If the weather is hot and dry at that season, which it sometimes is, the seed beds must have a good preparation, something after the manner I described for cuttings, and be watered and stirred about with the steel fork till the earth is thoroughly moistened for some distance into the ground ; then if the seeds are carefully sown and covered with some moderately-dry light soil, they will grow quickly, and with the greatest certainty, if shaded with a mat or something during the hottest part of the day, but uncovered at night. The seeds may either be sown in drills or broadcast. Drills are, I think, best, because they give greater facilities for stirring the surface among the little growing plants, which is an important matter. As regards the depth to cover different kinds of seeds, mistakes are sometimes made in burying too deeply, but not often, I think, when the beds have been prepared in the way I have suggested, as a vigorous new seed will force its way through a healthy medium even if buried to a greater depth than is re-

quired. I like to cover very fine seeds with something which does not cake together. Sand or sifted coke-dust, or, better still, charcoal-dust, is a capital material to cover delicate little seeds with, as it prevents damp lodging round the stems of the little plants after germination has taken place. Where the convenience exists, the very choicest things should be sown in pots or pans and placed in a close frame, and be shaded in the daytime till the seeds germinate. This plan gains time, and the longer a seed remains in the ground without germinating, as a rule the weaker becomes the vital principle which we call life ; and besides, in a frame under the eye of the cultivator, the little plants are exposed to fewer vicissitudes of weather, and are under less danger of attack from insect foes.

CHAPTER XVII

HARDY FLORISTS' FLOWERS

THE term florists' flowers as applied to hardy plants must always be somewhat arbitrary in its application, for though the florist's standard of beauty and perfection may be the same "yesterday, to-day, and for ever," yet the plants he works upon vary in their species and characteristics, and during the last forty years many new classes have been added to this list. It is true that the Tulip, the Ranunculus, the Auricula, the Pansy, the Carnation, Picotee, and Pink, are pretty much as I remember them thirty years ago. Gradual improvement has taken place, of course, but there have been no leaps and bounds on the march, as there have been with the Rose, the Dahlia, the Pentstemon, the Phlox, the Pyrethrum, and the Chrysanthemum. There is no reason that I know of why we may not feel an intense admiration for Nature pure and simple, and at the same time admire the handiwork of man and the way in which he has developed the capabilities of particular flowers; and I know from my own experience and my intercourse with others that there is a vast amount of pleasure to be derived from the cultivation of any plant or flower with the special object of making it conform to some particular standard of form, texture, or colour. In what follows it is not pretended that the subject has been exhaustively dealt with; the limits within which I am working preclude this being done, as nearly every one of the subjects entered into would form a suitable theme for a good-sized treatise.

The Hollyhock.—There is no class of plants which have such a noble appearance in the garden border, where the soil and situation are suitable, as the one under consideration. But of late years, in the southern counties, a red fungus (*Puccinia malvacearum*) has in many places made their cultivation so difficult that in some gardens the Hollyhocks have been given up. This fungus

usually makes its appearance in July (sometimes earlier), first on the under side of the leaves, rapidly spreading over their whole surface until the foliage withers and dies, the whole plant looking the very picture of wretchedness, as if it had been exposed to a hot blast from a furnace. In dealing with disease it is far better, by good cultivation, to try to prevent than to cure; in fact I am doubtful, when the conditions are favourable for its propagation, if this disease can be cured.

Prevention from Disease.—To have Hollyhocks free from disease they must have a deep, well-worked, well-manured soil. They must also have plenty of room for the air to circulate among the plants to harden the growth and make it robust, as in crowded beds the disease is always more destructive. I have seen this disease overcome by planting in trenches and heavily mulching; but if this treatment be necessary, it detracts somewhat from their usefulness, as they cannot have such conditions furnished for them in conspicuous positions, which, under favourable circumstances, the Hollyhock is so well fitted to adorn. In using them as back-grounds, large holes might be made, which should be partly filled in with prepared compost consisting of manure and turfy soil, and after the planting is finished the plant should stand in a small hollow or basin, to collect the moisture which falls from the clouds and retain the water that will be given to it from time to time in dry weather. It will be easily understood by one who gives any thought to the matter, that a plant with such a large top-development as the Hollyhock under average circumstances possesses, must dissipate a great deal of moisture, and to obtain first-class results an abundant supply must be at hand. This is why Hollyhocks are better grown in the north than in the south, where the rainfall is less. It is useless to plant them on poor soil, or on elevated situations where there is no great depth of soil.

To obtain fine flowers the spikes should be stopped when 7 feet or 8 feet high, and the individual flower buds should be thinned. Some exhibitors have an elaborate system of shading, and to bring out the soft delicate tints during a spell of hot weather, shade is necessary. April is the best month to plant, the plants having been well hardened by a free exposure for some time previously. Though the Hollyhock is in the main hardy in our climate, yet, during severe winters, many are lost when the plants are left out in the beds, and in the case of choice varieties they should be lifted in autumn, and either potted or planted thickly where they can be sheltered. It is the effect of the snow and cold rain alternating with frost which is so destructive to Hollyhocks, and those who have not the convenience or the room to winter plants

in pots may save them by digging them up and laying them by the heels, slantingly, in a warm dry border. In April they may be replanted in freshly-prepared land, and will be all the stronger and better for the change. Offsets with little bits of roots attached may often be found in spring in sufficient numbers to keep up a small collection. But the Hollyhock, like the Rose and all other florists' flowers, must be constantly in course of renewal; *i.e.* young plants must in some form be propagated every year to take the places of those plants which die or become weakly.

Propagating from Cuttings.—This is a very easy matter when one knows how to set about it. The side shoots, which spring from the lower part of the main flower spike or stem, make excellent cuttings when they are just getting firm, which is about the end of July. I have rooted these cut to single eyes, and planted them in a shady border; but to make good work there ought to be a covering of glass. If large numbers are required they should have a frame or pit to themselves. If only a few are required, a hand-light or cloche will do. I like to have the frame set on a hard bottom, with inclination facing the north. Place a thin layer of old rotten manure in the bottom; about 2 inches thick will be enough, and beat it flat with the spade; on this put 3 inches of light sandy compost, and a quarter of an inch of clean sand on the top; press it down moderately firm, making it smooth at the same time, and, about a couple of hours before the cuttings are inserted, water with a fine-rosed pot. The object of the layer of manure is to keep the base of the cutting moist without having to use the waterpots beyond a mere surface sprinkling till the cuttings are rooted. The side shoots, as I have said, make excellent cuttings when about half ripe, which is usually about the time the first flowers are opening, or say from the last week of July till the end of August, according to situation and locality. The shoots are cut into single eyes, leaving a couple of inches of the stem at the bottom, which is thrust into the prepared bed up to, but not quite burying, the eye. The piece of stem below the eye is of great value, as it steadies the bud in the soil, and affords support till roots are formed. The leaves will of course be removed, but it is a good plan to leave an inch or so of the leaf stalk. All the cuttings of one kind can be made and inserted in the bed in rows 3 inches apart, with about 2 inches of space between each, before any other kind is begun with, placing a label with each sort. Where a large number of varieties are grown, some care is requisite to keep them separate. When the cuttings are all in, keep the frame close, shading if necessary on bright days, and sprinkle lightly when the sand appears dry. The cuttings will soon begin to grow, and then

air must be admitted, in small quantities at first, increasing the opening as the cuttings gather strength. As soon as roots are formed, pot the cuttings into small pots singly, placing them until established in a close frame, and then the lights may be drawn off. It is best to winter the young plants under cover—a turf pit will do admirably. It will be well to give them a shift into larger pots in February, and plant out in April. Sometimes Hollyhocks are potted up in autumn, kept under cover all the winter, and the young side shoots which have sprung from the base are taken off and treated as cuttings, inserting them in $2\frac{1}{2}$ -inch pots, and plunging the pots in a gentle hotbed. This is done in spring, preferably in February or March. Occasionally they are grafted on pieces of roots or on the roots of vigorous seedlings. The grafting process, in my experience, is more reliable than cuttings in spring, as soft, young succulent growth is liable to suffer from damp.

Propagating from Seeds.—Seedlings are more vigorous than plants raised from cuttings, and vigour is especially important in districts where the fungus is prevalent; hence it happens that many people who only grow Hollyhocks for the display they afford, without any thought of exhibiting, grow seedlings only, in some instances saving the seeds from the best flowers of their own growth, in others buying from some well-known trade grower, who makes a specialty of Hollyhocks. In either case seedlings producing beautiful double flowers may be obtained. Hollyhocks, under ordinary circumstances, are biennials, *i.e.* they flower the second year; but it is possible, by sowing the seed in pans early in the year, and placing the pans in a warm house, or in a hotbed—a cucumber frame, for instance—and growing the young plants under glass, giving them the same attention as is commonly given to bedding plants, to make them blossom the same year. In some instances the blooming would be late in summer, or perhaps autumn, but they would all flower the same year with certainty. If any one with a diseased collection elects to fight the fungus, the same remedies which kill fungus generally—namely, sulphur, soft soap, and lime in some form—are the most successful. I have got it under by the use of Gishurst compound, but one must always be on the watch, especially when dry weather sets in. If the foliage once becomes badly affected, there is no hope of saving it, and Hollyhocks do not put on a new covering of leaves like other plants.

Varieties.—Countess of Craven, peach; Charles Eyre, dark crimson; Consul Beda, crimson; Cygnet, white; Earl of Rosslyn, scarlet; Earl of Breadalbane, scarlet; Fred. Chater, yellow; Glory, red; Gem of Yellows, yellow; Hercules, crimson; James Anderson, rosy peach; Lady Middleton, blush; Lady W. W.

Wynn, rose blush ; Lord Lyon, cherry rose ; Lady Rokeby, blush ; Lord Clifden, crimson ; Lord Rokeby, magenta ; Mrs. Hastie, rose ; Mrs. Bouce, carmine ; Mrs. F. M'Kenzie, scarlet ; Mrs. Downie, salmon rose ; Purple Emperor, purple ; The Prince, buff ; William Thompson, rosy crimson.

Some of the above varieties have been in cultivation a good many years, but are none the worse for that, as new varieties, possessing superior merits to the old standard sorts, are not easily obtained.

Carnations, Picotees, and Pinks.—This is a little group of plants which have long been great favourites with florists of limited means. They have always been made much of in the northern towns, and, possessing the power of thriving in a smoky atmosphere better than most evergreen plants, they are well adapted for the suburban amateur. Many of the large growers keep their collection always in pots, and have cool houses, covered with canvas or tiffany, for their display. A collection in flower managed after this fashion is a beautiful sight, but I know a good many young people who grow good flowers with their plants in beds, with only a glass frame to shelter them in winter, and a tiffany blind to hang over the bed when the plants are in blossom. For my present purpose the Carnation and Picotee may be classed as one ; the Pink I will speak of later on.

Soil and Planting.—A deep, rich, somewhat gritty loam forms the best soil, and considering that a moderately-sized bed may contain a good many varieties, the natural soil of the place, if of indifferent quality, should be changed or improved, by taking out all the bad and filling in with good turfy loam, with which a little old cow dung has been blended. Assuming that the plants are wintered in pots in a light, well-ventilated frame, the beds should be prepared early in winter, and thrown roughly into a ridge or a series of ridges, to get well pulverised and sweetened. If there is any suspicion of wireworm being present, the soil should be carefully turned, and every suspicious insect picked out, and, to make doubly sure, after the plants are in the bed insert slices of Carrot just beneath the surface, for the purpose of attracting the worms, when they may be captured and destroyed. In March the beds should be levelled down, and towards the end of the month, or beginning of April, the plants should be put out in pairs 18 inches apart, which will leave plenty of room between for layering the young shoots when fit for the purpose. The beds may be 4 feet wide, with one row of plants along the centre and a row on each side ; or they may, if desired, be only 3 feet wide, containing two rows of plants only. Beds of either size with

alleys between enable the cultivator to give the plants frequent attention during the growing season without treading on the bed.

The routine work will consist of weeding, watering, and tying up the flower stems with care, and during the time this work is going on, very frequent, almost daily, attention will be needed to prevent the ties doing injury. To obtain very fine flowers the buds should be thinned, and after the flower buds are formed a mulch of very old manure all over the bed will be beneficial. It keeps the soil in a nice moist condition, without so frequently having recourse to the waterpot as would otherwise be necessary. To obtain flowers with correct markings a thin shade will be necessary as soon as the flowers begin to expand. Occasionally a bud may, during a rapid season of growth, burst open prematurely, by cracking up the side. If the bud can be spared, remove it; if not, a bit of soft matting wound round to check the lateral movement, and give time for the bud to swell out in its normal state, will be found to answer.

Propagation by Layers.—This is the recognised mode of increase by the leading growers, and it is generally performed in July, when the young shoots are getting firm at the base. The requisites needed for the work are a sharp knife, some hooked pegs, and a supply of gritty compost, to cover the wounded part and induce an early formation of roots. All the shoots that can by any means be made to reach the earth may be layered. First place some of the gritty compost several inches deep round the base of the stool, then take each shoot in succession, strip off any leaves from the bottom of the branch that may be in the way, then make an incision on the underside of the branch, cutting half way through the stem in a slanting direction through a joint. Sometimes a piece of the tongued portion is removed, but this is hardly necessary, as simply cutting a slit in the stem arrests the sap at that point, which, when it is pegged down and buried firmly in the sandy compost, produces roots freely. If done during dry weather, or if drought sets in before the layers are rooted, watering should be resorted to, in order to get the layers rooted early in autumn. After those young shoots which can reach the soil are layered, the others from the middle of the plants may be taken off and used as cuttings or pipings. Carnations and Picotees root as freely this way as Pinks do, and this plan is not so troublesome to perform as layering, only the pipings will require to be covered with handlights, or be planted in a frame. It sometimes happens that plants turned out late, and which, perhaps, are weakly through being layered and potted late in autumn, spindle without making any grass; and not only will the flowers be poor, but the plants

will probably die if allowed to flower at all. In this case it is better to sacrifice the flowers by cutting the spikes off, and encourage the production of growth, which may possibly be strong enough to make cuttings. The remedy, of course, is to propagate early, and establish the plants in pots, so that they receive no check when planted out.

Raising Plants from Seeds.—This is most interesting work, especially when set about in a systematic manner, *i.e.* when the flowers are carefully fertilised with pollen from a variety calculated by the properties which both parents possess of raising improved flowers. Unless this care is exercised there is very little chance of raising anything worth saving. Of course all seedlings, if the flowers are double, are worth a place in the border for the production of flowers for cutting, as scarcely anybody has too many Carnations or Picotees for that purpose. Having decided upon the parentage of the proposed seedlings (and as a rule both should belong to the same class), a little before the blooms are quite expanded, or at any rate before the anthers are mature or fit to burst, two or three of the inner petals should be removed from the female parent, as well as all the stamens from the same flower, with a small pair of propagating scissors, but in no way to interfere with or injure the styles. The blossom intended to furnish the pollen is then operated upon, but in a different manner, as in this case the stamens must be left, removing the style or stigma and a few of the inner petals. These latter must be carefully extracted so as not to injure the base of the stamens. As a rule the top flowers in each plant are the best to save seed from, and as soon as the pollen is in a fit condition it may be applied with a small camel-hair pencil to the style of the female parent. The saving of really choice seeds is an important matter, and is best carried out under a glass roof of some kind. The pods should be carefully gathered when ripe enough. All seeds of this class of plant keep best in the pod till spring, when they should be rubbed out and sown in a gentle warmth—the greenhouse or a slight hotbed will do. The seedlings should be potted as they require it, and may either be kept in the pots the first year and be planted out in March of the second year, or be planted out as soon as large enough the first year. All I have written will apply as well to the Picotee as the Carnation.

Pinks are of smaller growth than Carnations, and will bear more hardship from stress of weather. Consequently, there is no occasion to winter them in frames; indeed, the best-marked flowers are from autumn-planted beds. The preparation of the beds is important; fresh turfy loam, if prize flowers are wanted, is very

desirable. October is the best month to plant finally in the beds, and they should not be crowded; from 10 inches to 12 inches apart each way will not be too much where a lot of flowers are required when autumn planting is adopted. Of course thousands of Pinks are planted in February, and they do fairly well; but to obtain flowers of the best quality, perfect in lacing, there must be no undue excitement of any kind, but the plants must grow steadily on from the first, and this condition is more easily secured when planted in autumn. Thinning of the flower buds will be necessary to obtain flowers of extra size and beauty. Shading, mulching, and watering will also be required in dry weather. The young wood will be fit for cuttings or pipings early in July, and it is as well to begin as soon as the earliest shoots are ready. Any kind of glass frame will do for striking the pipings or cuttings under, and they should occupy a shady place. Old-fashioned florists were partial to handlights for this work, and they were usually placed in rows on the shady side of a fence.

The soil was excavated about 8 inches deep, and a layer of Rhubarb leaves placed on the bottom; the cavity was then filled up with a light sandy compost, pressing down moderately firm, watered with a fine-rosed pot, and the pipings pressed into the moist soil. The layer of Rhubarb leaves was intended to hold up the moisture, so that no water was required beyond the very light dewings over the foliage which were always given on very bright days. But the propagation of Pinks is easy and simple enough; I have seen thousands of them struck since those early days in a frame with no preparation beyond a layer of sandy soil in the bottom. All through the season, from July till September, of course the early-struck plants are the best; and with the September cuttings more time is required in the cutting bed; indeed, the late cuttings, when the wood is getting firm, should remain in the bed all the winter, and not be planted out till March. Such plants will not produce such perfectly-laced flowers, but they bloom later than those struck early—form a succession in fact, and for that reason, as Pinks are so beautiful for cutting, I like a few late cuttings.

Pinks may be layered the same as Carnations are, but it is hardly worth while when they strike so freely and make such good plants from cuttings. The remarks I made upon saving seeds from Carnations are equally applicable to Picotees and Pinks, and the treatment of the young plants is the same in all respects. For producing cut flowers the perpetual Carnations are very valuable; planted out in the open air, in warm sheltered borders, they bloom well up into the autumn, and quite equal those plants which are

kept in pots, especially for the greenhouse. Some cultivators plant out their whole stock in beds, because they do better so treated, and lift them and place them in pots towards the end of September.

Forcing.—When properly prepared, Pinks submit readily to forcing; the cuttings should be struck early from plants which have been forced. They should be planted out when large enough, and be lifted in September; they will not, of course, bear a strong heat, but in a light position in the greenhouse they will flower early enough to be exceedingly useful; or, if necessary, after they have been in the greenhouse a few weeks, with the advancing light of the new year they will stand an increase of temperature. In the annexed list are good standard varieties, which may be purchased at a reasonable price.

VARIETIES OF CARNATIONS.—*Scarlet Bizarres.*—Achilles, Dreadnought, Duke of Grafton, Garibaldi, George, Lord Derby, and Prince of Wales.

Crimson Bizarres.—Alderman, Chairman, Eccentric Jack, Isaac Wilkinson, Sybil, Laura Hinchinbrooke, W. Henfield, Esq.

Purple Flakes.—Ada, Miss Miles, Mayor of Nottingham, Lord Sandwich, Squire Trew.

Rose Flakes.—James Merryweather, Lady Florence, Lady Jane Repton, Lady Mandeville, Miss West, Mr. Woodruffe, Mrs. Hurst, Pallida, Rosabel, Rose of Stapleford.

Scarlet Flakes.—Adrian, Douglass, Guy Mannering, James Cheetham, Splendour, Superb.

VARIETIES OF PICOTEE.—*Red Edged.*—Ada Mary, J. B. Bryant, Delicata, Forester, Duchess of Bedford, Lizzie, Minnie, Mrs. Brown, Mrs. Ormsby, Wm. Summers.

Purple Edged.—Edmund Papworth, Lady Elcho, Mary, Lady Sandwich, Mrs. Little, Mrs. Summers, Robin Hood.

Rose and Scarlet Edged.—Beauty of Plumstead, Dolly Varden, Edith Dombrain, Mrs. Fordham, Rev. H. Mathews.

Yellow Ground.—Prince of Orange.

VARIETIES OF PINKS.—Attraction, Arabella, Beauty of Bath, Bertram, Brilliant, Charles Turner, Criterion, Device, Donald M'Bean, Endora, Emily, Excelsior, Fanny, John Bull, Lady Clifford, Marian, Modesty, Mrs. Hobbes, Minnie, Oliver Cromwell, Prince Imperial, Ninon, Wm. Paul, Victory.

Border Carnations, Picotees, and Pinks.—These are a very useful class for producing cut flowers. Of late years the demand has led to more attention being given to them, with a consequent increase in their numbers. I append a short selection:—Acme, Ariadne, Bijou, Corsair, Buttercup, Duchess, Fancy Queen,

Fireman, Ingoldsby, Lucretia, Newmarket, Nigger, Black Knight, Duke of Wellington, Flag of Truce, Ghost, Napoleon III., Purity, Royal Scarlet, Souvenir de la Malmaison, Old Crimson Clove, Old Purple Clove, Old White Clove.

Border Pinks.—Ascot, Anne Boleyn, Brightness, Fimbriata alba major, Lord Lyons, Mrs. Moore, Newmarket, White Perpetual.

Mule Pinks.—Hybridus flore-pleno: Multiflora rosea, Marie Parés, Napoleon III., Stratiflorus, Tom Thumb. The Mule Pinks are useful border plants.

The Phlox.—The improvement which has taken place in this family within a recent period has been immense; in fact it is difficult to say what now remains to be done in the way of advancement, though the real florist does not admit the word “finality” into his vocabulary. Of the two sections into which the herbaceous Phloxes have been divided, under the names of decussata and suffruticosa, the former is the most useful, being more robust in habit, and the blooming period being of longer duration. Still, where there is space, both species should be grown, as the suffruticosa section, besides the advantages of early flowering, are sweet scented, and are chaste and delicate in colour. An open situation, good, rather strong, soil liberally manured, and frequent renewal either by cuttings or division of the roots in spring, are among the chief essentials to their successful culture. When coming into flower and during the blossoming period, plenty of water is requisite. If we want spikes for exhibition, mulchings too of manure are suitable. If more spikes show than are required, they should be thinned early, removing the weakest. For merely decorative purposes in the border, more stems may be left than would be desirable if we want fine individual spikes. The Phloxes are so beautiful and hardy, and serve so many purposes, that every one should grow at least a dozen varieties. They should be divided and transplanted every three years at least. New varieties may be increased by cuttings at any time in a shady border. They also strike as easy as Verbenas in spring in a hotbed.

VARIETIES — *Suffruticosa* (early flowering). — Alba magna, white; Allan M'Lean, rosy purple; Beauty, rosy lilac, crimson eye; Circle, white, crimson eye; Conqueror, white, scarlet eye; Empress, white; Harrison's Seedling, white, shaded centre; Mauve Queen, King of Purples, Mdle. Rendatler, rose petals, with white stripe on each; Mrs. Campbell, white, rose eye; The Shah, rosy purple; Philip Pollock, light rose.

Decussata (late flowering).—Admiration, red, crimson eye; Boule de Feu, salmon, crimson eye; Brilliant, rose; Comtesse de

Castries, white, scarlet eye ; Countess of Breadalbane, crimson ; Coccinea, scarlet ; Dr. La Croix, rosy purple ; David Syme, white, magenta eye ; Duchess of Sutherland, white ; Edith, white, carmine eye ; Gladstone, rosy lake ; John Forbes, pink, crimson eye ; Jean d'Arc, white ; Liervalli, rose, striped white ; Madame de Staël, pink, carmine eye ; Moonlight, rose ; Mons. Van Houtte, crimson, dark eye ; Pericles, salmon red, carmine eye ; Madame Peulet, white, crimson eye ; Princess of Wales, rose, carmine eye ; Roi des Roses, rosy salmon ; Splendour, crimson, purple eye ; Virgo Marie, white ; William Veitch, white, crimson eye ; Zingari, scarlet, salmon eye.

Pentstemons.—A vast improvement has been effected by modern florists in this family. In 1845 I remember *P. gentianoides*, the parent of the present race, was thought much of as a bedding plant. Then about 1848 came the white variety, *P. g. alba*, and about the same time was brought out a rose-coloured variety, with a white throat, called *P. g. MacEwani* ; but it is only quite recently that the impetus was given which has made the Pentstemons the handsome family they now are. They are easily raised from seeds, and the seedlings all possess a decorative value. They are everybody's flowers, for, though scarcely hardy enough to stand a severe winter, yet a small amount of protection saves them.

Cuttings root freely at any season when growth is in progress and young side shoots can be obtained. In the spring they may be placed in the hotbed with other soft things, but in summer and autumn they will root under a handlight, or in a cold frame, and cuttings or seedlings raised in spring flower profusely the same season. I saw in a friend's garden lately a large border of seedling Pentstemons, which had been planted merely for their decorative value ; but though raised in the ordinary way from purchased seeds, the mass contained many pretty varieties, such as would have been selected and named a few years ago. Those who are tired of the glare of the *Pelargonium* will appreciate the softer tints and the greater variety of the Pentstemon, and the broken surface of the mass comes as a great relief after a formal bed arranged with mathematical precision. Everybody should grow some of them, and should save seeds from the best flowers. But for the purpose of perpetuating any particular variety cuttings alone must be employed, as seedlings break off in all directions from their parents. If the cuttings are dibbled thinly in a cold frame, or under handlights or cloches in August, and are left under the protection of the glass till April, and then planted out in the beds, they do not give much trouble, and will be sure to succeed

under ordinary treatment, as they are not particular about soil or situation. Pinching once or twice after planting, though it delays the flowering for a short time, adds immensely to the strength of the plants, and tends to prolong the flowering period till late in the autumn. I sometimes peg the plants down after they are established in the beds, and this causes a lot of strong shoots to spring up from the bottom, which flower later on. In mild winters old plants in the beds and borders will pass safely through the winter, and if in spring they are pruned back, strong bushy plants are formed; but to keep up a good collection of named varieties, cuttings must be taken annually, as, although fairly hardy, they cannot always be relied on to live through the winter—at least I often lose old plants in sharp winters when left unsheltered. A little old tan or leaf-mould about the collar, and, after the frost has set in, a handful of dry Fern placed over each plant, will generally save them; but young plants are most reliable. The spikes of tube-shaped flowers are useful for cutting, and have a nice effect in a vase, as they relieve the dumpiness of the flat flowers, and cutting improves the plants by causing successional spikes to spring up. Pentstemons are valuable

Pot Plants for autumn in a cool conservatory, and their culture will yield as good a return for the trouble bestowed as anything I know, either as bed or border plants, or in pots. Though lists of plants which are progressing rapidly have no permanent value, I give below the names of a few good varieties:—Alice Dean, white, shaded rose; Andrew Hunter, rosy salmon; Avoca, rose, white throat; Bateman Brown, pink, white throat; Blue boy, blue, shaded purple; Countess of Eglinton, bright rose; Cuthbert, red, throat-pencilled carmine; Don Juan, rosy lilac, white throat; Duke of Sutherland, scarlet, white throat; E. S. Dodwell, purple, suffused white; Fanny Archer, plum, pencilled throat; Frank Miles, plum purple, throat blotched with brown; Grace Darling, rosy pink, white throat; Harold, magenta, white throat; John Gray, rosy scarlet; John Douglas, violet, tinted purple; Kate Nickleby, pink, white throat; Miss Sutherland, white, edged with pink; Mrs. Wills, claret crimson; Miss Linley, white; Mrs. Lee, rosy pink; Mr. Rowe, scarlet; Orion, magenta; Reformer, purple; Stanstead Rival, scarlet, white throat; Virginale, pure white, tipped pink; Wm. Ashford, magenta red; Trojan, scarlet.

Pentstemons, like nearly all hardy plants, when grown under glass through the winter, will produce a lot of young soft shoots, which strike in the hotbed with the bedding plants in February or March, and this is a good way of increasing new or choice varieties.

The Antirrhinum (Snapdragon).—Like the Pentstemon,

the Antirrhinum or Snapdragon should be in every garden, and the present race, which has undergone the attentions of the florist, is immeasurably superior to anything we possessed years ago in old-fashioned gardens. The colours are so various, and the plants flower so freely, that they are indispensable to those whose means are limited, and yet like to see their borders gay and bright all the summer and well up into the autumn ; or if the seeds are cut off, the Antirrhinum never seems to become exhausted, crop after crop of blossoms being thrown off with great rapidity. It is well to have a good collection of choice-named sorts, but it is by no means necessary, for the seedlings are good enough for those who only want a pretty garden, and a good collection requires time and talent to keep together and perpetuate by frequently taking cuttings. Unless this is done the old plants have a habit of going off in the winter, not because they are not hardy enough to stand a considerable amount of cold, but perhaps exhaustion after a long blooming season may have something to do with it. At any rate a good-named collection requires more care than seedlings, and those who only require a bright bed or border will sow seed.

Cuttings may be taken any time in summer when young shoots can be obtained, and they strike readily under handlights in a shady corner, or in pots in a close frame in sandy soil.

Sowing Seed.—The seeds may either be sown in August in the open border, or in spring under glass. In the former case they may remain in the seed bed till April, and then be transplanted to their blooming quarters. In the latter alternative, the little plants should be pricked off when large enough, and be planted out in April or May. There are two distinct races—one grows tall on good soil—from 2 feet to 3 feet high, and the other, the Tom Thumb section, is only a few inches high. Though both are beautiful for ordinary purposes in the garden, and for the production of large quantities of bright-coloured flowers for cutting, the tall section is the most useful. The Antirrhinum might be utilised for covering any banks in the wild garden, or for rapidly clothing with beauty waste corners anywhere, either by scattering seeds over the site in August, or sowing the seeds elsewhere then and transplanting in spring. Following a precedent I set in the case of the Pentstemons, I give a list of a few good varieties :—Alba perfecta, white and rose ; Admiral, orange and scarlet ; Blanche, white, tipped yellow ; Ambassador, purple and orange ; Brilliant, crimson ; Charlemagne, yellow ; Cyprus, crimson and lemon ; Contrast, dark crimson ; Curiosity, orange and crimson ; Dan Hope, pale yellow ; Donation, crimson, white tube ; Dr. Greville, rose and buff ; Emblem, white, magenta, and lemon ; Fascination, white, rose, and lemon ; Harle-

quin, white, mottled with rose; Hendersoni, white and violet; Fanny, sulphur yellow; Florence, pink and white; Glory, white and crimson, tipped yellow; Lamplighter, rose, yellow lip; Lilian, white; Miss Davis, pink; Mrs. Ashford, white, spotted with crimson; Mrs. Hodge, yellow, carmine striped; Major Stewart, crimson and orange; Nina, white, mottled rose; Murillo, sulphur, crimson spots; Namur, rose pink, yellow tip; Rosy Morn, rose; Royal Albert, yellow, red striped; Sir George Douglas, carmine; Sunbeam, white, peach stripes.

Potentillas.—I have before me a list of twenty *Potentillas* which were grown in 1848, and with most of them I was well acquainted as rock and border plants at that time. Some of them might be found now in old-fashioned gardens, but for the most part they have disappeared. With one exception they bore single flowers, and the exception in question was a seedling raised by Messrs. Pope of Birmingham, and sent out, I think, about the year 1845, under the name of *Potentilla atrosanguinea* fl.-pl. The flowers were not very double—perhaps semi-double would be a better description. Since then the *atrosanguinea* strain has been extensively worked upon, and many beautiful hybrid forms, some bearing showy double flowers, have been the result. There is, I think, a future before the double *Potentillas*. When better known they must become popular. They will succeed in any good garden soil, are very hardy, and easily increased by division in autumn or early in spring. They also ripen seeds abundantly, which, if sown as soon as they ripen, will make flowering plants the following year. The flowers of some of the double varieties are very large, and the colours bright and pleasing. I find by picking off the seeds the plants flower up to the autumn.

Double Varieties.—*Californica*, yellow; *Cameleon*, scarlet and yellow; *Dr. Andre*, yellow, suffused with vermilion; *Don Quixote*, yellow and scarlet; *Hamlet*, crimson; *Jane Salter*, orange and scarlet; *Louise Van Houtte*, dark crimson; *Perfecta*, crimson and yellow; *Purpurea*, dark scarlet; *Victor Lemoine*, scarlet and orange; *Versicolour*, pretty flaked and blotched variety; *William Rollisson*, dark crimson and orange.

Single Varieties.—*Atrosanguinea*, dark crimson; *Golden Cup*, yellow; *Goldfinch*, yellow and brown; *Harlequin*, yellow and scarlet; *Magnet*, crimson; *Sanguinea*, red; *S. aurea*, scarlet and orange; *Striata multiflora*, orange, with scarlet stripes; *Splendens*, orange and scarlet.

Pyrethrums.—In their present form the *Pyrethrums* are a comparatively recent triumph of the florist, for though the species (*roseum*) from which the beautiful varieties under consideration

originated was introduced towards the end of the first quarter of the present century, yet most of our present beautiful varieties are quite modern ; and though they are slowly making their way over the country, yet they are still lacking in many good gardens, and are altogether absent from cottage gardens. They require no special treatment, and are not particular as to soil or situation, and they are among the few plants which do not deteriorate by remaining several years in one position. They are specially valuable for cutting, and those who cut freely may impart a successional character to the plants, as it induces a new growth to spring up which will flower later. They are very showy in a mass, their flowers being large and bright coloured. A plant so hardy and easy to propagate as the *Pyrethrum*, and one that moves with so much certainty when treated as a hardy plant, should blossom freely the first year after planting, if planted in autumn or early in spring ; but many of the little bits that were sent out a few years ago took a couple of years to become established, and many died ; and in their young state especially, if not robust, the slugs and snails settle themselves round the collar of the plants, and unobserved eat off the young growths as they spring from the crown. Little plants are often lost in this way, as the *Pyrethrums* do not seem to possess the power of pushing latent buds in the same way as many other plants when their first breaks have been eaten off and destroyed. I find the best way to keep the slugs at a distance is to put a ring of sifted ashes round the plants in autumn or early in winter, and keep them there till the shoots are above ground in spring.

Propagation.—*Pyrethrums* are easily propagated by division of the crowns in autumn or spring. I prefer the latter season, lifting the roots carefully up just as the young shoots are pushing, as then we can see better where to cut ; and I prefer also a sharp knife to do the work with, as a clean-cut wound is better than one with rough, jagged edges. If a large stock is required, the crowns may be divided into as many pieces as there are eyes or buds, and some time will be gained by potting the little plants and just giving these a start by placing them in heat for a time till growth has proceeded a little, and new roots are formed. It is a common practice, when dividing the crowns in autumn, to place them in pots and keep in a cold pit or frame till spring ; but when the propagating is left till the spring, the little plants may, if desired, be planted out at once. The propagation really belongs to the work of the reserve garden ; planting the young pieces for a year in a nursery bed, where more attention can be given them than is possible in a border among strong-blooming subjects, is a decided

advantage. Pyrethrums are easily raised from seeds sown in spring, or, if preferred, the seeds may be sown as soon as ripe. Many of the seedlings will bear only single flowers, but they all possess a value for border work, and single flowers are sought after for cutting nowadays. Groups of the inferior seedlings may be planted in the wild garden, and permitted to become naturalised.

Double-flowered Varieties.—Album plenum, white; Achilleæ, pink; Amethyst, pink, yellow centre; Atrococcineum, scarlet; Annie Holborene, white, blush centre; Carneum plenum, rosy carmine; Ceres, flesh colour; Captain Nares, crimson; Herman, Stenger, rose; Endymion, lilac, white centre; Emile Lemoine crimson, tipped with gold; Flora, blush; Floribundum plenum, rosy pink; Monsieur Barral, crimson; Mont Blanc, white; Imbricatum plenum, purple carmine, tipped with white; La Vestale, blush; Madame Patti, rosy lilac; Ne Plus Ultra, lilac; Olivia, white; Rose Perfection, rose; Progress, dark red; Solfaterre, sulphur; Striatum plenum, striped rose; Thomas Massart, peach; Uzziel, fawn.

Single-flowered Varieties.—Coccinea, red; Fairy, flesh colour; George Nelson, white; Grandiflorum, carmine; Rosy Morn, pink; Virginal, French white; Vivid, amaranth; Warei, crimson.

The Dahlia.—The introduction of the single-flowered Dahlia has given an impetus to the resuscitation of a grand old favourite plant, as the present craving for the single-flowered varieties is sure to culminate in an impetus being given to the cultivation of the beautiful large double flowers by and by. The Dahlia in any form is unquestionably a noble-flowering plant, and is less affected by diseases and less liable to insect attacks than many other flowers. It is true that there is nothing absolutely free from troubles of this character, and early in the spring the slugs and snails are excessively fond of the thick succulent shoots, often in a single night eating the heart out of a choice plant and leading to its ruin, as perfect success with this flower depends in a great measure upon its uninterrupted progress, especially in its young state, for the main stem should ascend unopposed to attain perfect development. But the slugs and snails can be easily circumvented by placing round the plants a circle of something that snails do not like to travel over. A small ridge of coal-ashes or sawdust will be sufficient to secure the young plants from depredation, for it is only when they are young that they need protection. Later on in the season another trouble arises, for the earwigs attack the flowers, eating and disfiguring the petals. These latter pests may also, with a little trouble, be kept under. The earwigs, after they have satisfied their hunger, retire into some snug retired place to

rest, and they are specially fond of a nice soft bed of hay, and, knowing this weakness, the Dahlia grower makes up a bed of hay and places it in a flower-pot, elevating the pot on the top of the stake ; the pot is inverted on the stake, with the wisp of hay inside. Large pots are not needed—5-inch pots will do. After feeding, the earwig ascends to his bed for repose, and while in this condition he is easily shaken out of the hay into a vessel of hot water and destroyed.

Soil.—Though the Dahlia as a merely decorative plant is not particular as to soil, yet to obtain show flowers such as are seen on the exhibition tables they must have a good deal of attention. In the first place the land must be deep and rich, and if it is not so, or is lacking in any particular, stations should be taken out for each plant, and a barrowload of old turf and manure in about equal proportions placed in the hole, in the centre of which the plant should be placed. It is, of course, possible to overfeed, and then the flowers lose that refinement of form and appearance which a well-grown flower should always possess. But the mischief which leads to coarseness of outline and roughness of petal is generally produced by the too free use of strong liquids rather than anything in which the plant may have been planted. The bed or quarter intended for Dahlias should be trenched up roughly in winter and left exposed to the weather, then in April mark out and prepare the holes ready to receive the plants about the third week in May.

The propagation of Dahlias is a very simple business. In February or March the roots are taken from their winter quarters and placed in a gentle hotbed, or in some house where a moderate temperature is kept up. As soon as the young shoots are 3 inches long they may be taken off and rooted in small pots. Where only a limited number of plants are required, the young shoots may be cut with a little bit of the old tuber attached ; but where it is necessary to make as many plants as possible, take the cutting off just above the bottom pair of leaves, as from their axils two young shoots will spring, which in time may also be taken off and rooted. The little pots, when the cuttings are inserted, should be plunged in the hotbed till rooted. Afterwards, the usual treatment given to ordinary bedding plants will suffice for Dahlias.

Summer Management.—When the planting season arrives drive the stakes firmly into the ground, and plant a Dahlia at the foot of each stake, and then as growth progresses all one has to do is to attach a tie loosely to it. This must be done loosely, as the stem swells so rapidly that it may be cut by the tie if room is not left for growth. Viewed as ornamental plants only, the Dahlia has a graceful habit without much pruning, and with one stake to

support the main stem, the outside shoots can be linked to it, and thus a cone—which is the most graceful outline that any plant can assume—is formed naturally; but every shoot of any size or weight must have a tie to support it, as the branches, unless secured, are very apt to be splintered off by the wind. When grown to produce grand flowers for exhibition, the ornamental appearance of the plants is sacrificed, for much pruning has to be done to throw their whole strength into a few channels. Other stakes besides the centre one must be employed, and after the best buds have been selected the others must be cut away. Then as the buds begin to expand shading must be brought into requisition, and in dry weather watering and mulching must have attention. A plot of exhibition Dahlias, apart from the really grand blooms which appear to be hidden away under shades made of tin or zinc during the season of exhibition, is not to the orderly-minded man a pleasant sight; but then many take pleasure in it, and there is room enough for every man's hobby. Preparing and dressing the flowers for exhibition is an art which can only be learnt by seeing others do it, and by actual experience. There is an art in setting things up to the best advantage, which, in some people, is intuitive; and others, no matter how much they may try, never excel in it. Choice varieties of Dahlias are frequently propagated in summer. Cuttings of the young shoots strike freely in single pots in a close frame. The plants so raised are usually wintered in the pots in a dry state and secure from frost.

Winter Management.—As soon as the frosts of autumn have destroyed the beauty of the plants, cut the tops down to within 6 inches of the ground. About a week afterwards, selecting a dry day for the operation, lift the roots carefully with a fork and place them in some airy outhouse or shed, each plant to have its name or number securely fastened to the remains of the stem. When the roots have been thoroughly ripened and dried they should be packed away in a fairly dry situation till it is time to excite them into growth again in spring. There are various ways of preserving the roots of Dahlias in winter. When the moisture which exudes from the stem has dried up, and the roots have entered into the state of rest which good cultivators seek to secure, they may be packed in dry sand in a cool room or building where frost cannot enter. I have kept them safely and well in a dry dark cellar, on a shelf, stem downwards. The object of placing them in the latter position is to make sure that no moisture lingers about the base of the stem, as (if any remains) there it may set up decay. Dryness and coolness are the conditions aimed at, but the thermometer in the place must not descend below freezing-point,

as no part of the Dahlia will bear frost. Dahlias in cottage gardens frequently live through the winter in the ground, though in the event of a severe winter, if the frost reaches them, they die; still, I have known them kept in this way for a long time, covered with a mound of ashes in winter before sharp frost sets in; but the plan has nothing to recommend it where really good culture is aimed at. Dahlias are not often employed as wall plants, but I once saw a low wall covered with them, and very effective it looked. The plants had been there for several years without removal when I saw them, and had acquired great strength, and being in a small sheltered back garden, they commenced to flower early, and continued to bloom long after those in the open garden had been cut off by frost. They were trained to the wall, and the growth being thinned and the leading shoots unstopped, the plants reached a considerable height. In winter the crowns were covered with Cocoa-nut-fibre. Altogether, I thought the idea was not a bad one, and showed that a mind untrammelled may discover novelty of treatment in many ways if allowed scope. Dahlias are easily raised from seeds, and the seedlings flower the same year, though as regards the double varieties, unless the business is entered upon systematically and extensively, there is not much chance of eclipsing the best varieties already sent out. I append the names and heights of a few good varieties in the various classes:—

Double Dahlias (Show).—Annie Gibbons, primrose, 4 feet; Aurora, buff, $2\frac{1}{2}$ feet; Burgundy, puce and maroon, $3\frac{1}{2}$ feet; Canary, yellow, 4 feet; Charles Lidford, yellow, crimson edge, 3 feet; Countess of Lonsdale, rosy lilac, 4 feet; Cardinal, scarlet, 3 feet; Celestial, French white, 3 feet; Comet, red, 2 feet; Critic, lilac, $3\frac{1}{2}$ feet; Cremorne, yellow, tipped with red, 3 feet; Crown Prince, pale buff, 4 feet; Ethel Britton, blush white, purple edge, $3\frac{1}{2}$ feet; Flag of Truce, white, lilac tipped, 3 feet; Frank Rawlings, magenta, 3 feet; George Goodall, scarlet and orange, 3 feet; Goldfinder, yellow, tipped with red, 2 feet; George Dickson, chestnut brown, 4 feet; Henry Bond, rosy lilac, 4 feet; Henry Walton, yellow, vermilion edge, 3 feet; Joseph Ashby, orange, 3 feet; John Laing, scarlet, 3 feet; John Bennett, yellow, scarlet edges, 3 feet; John N. Keynes, yellow, $3\frac{1}{2}$ feet; James Vick, maroon, 3 feet; Miss Henshaw, white, $3\frac{1}{2}$ feet; Mrs. Harris, white, lilac edge, $2\frac{1}{2}$ feet; Mrs. Stancombe, yellow, tipped with fawn, 3 feet; Queen's Messenger, purple, 3 feet; Maggie Fairburn, pale lilac, 3 feet; Ovid, purple, $3\frac{1}{2}$ feet; Shirley Hibberd, dark crimson, 3 feet; Sarah McMillan, pink, 3 feet; Rev. Dr. Moffat, mulberry, 3 feet; Royal Queen, white, tipped with peach, 3 feet; Triumphant, rosy purple,

4 feet; W. H. Williams, scarlet, 4 feet; Pioneer, dark crimson, 3 feet.

Double Dahlias (Fancy).—Annie Pritchard, white, lilac and rose, $3\frac{1}{2}$ feet; Chorister, fawn, crimson and rose, 3 feet; Charles Wyatt, rose and crimson, 4 feet; Florence Stark, white and purple, 3 feet; Flora Wyatt, orange and red, 4 feet; Frederick Smith, lilac and purple, 4 feet; Hugh Austin, orange scarlet and dark red, 4 feet; James O'Brien, yellow and crimson, 3 feet; Jesse M'Intosh, red and white, $3\frac{1}{2}$ feet; Janette, sulphur, white tipped, 4 feet; Lady Antrobus, red and white, 3 feet; Beauty, yellow and light rose, 4 feet; Miss Bond, lilac, maroon spot, 3 feet; Professor Fawcett, lilac, chocolate stripe, 3 feet; Robert Burns, lilac and maroon, 3 feet; Regularity, blush white and crimson, 4 feet; Rev. J. B. M. Camm, yellow and red, 3 feet; Sam Bartlett, blush and crimson, 3 feet; Trotty Veck, yellow and purple, 3 feet; William Ady, lilac and purple, $3\frac{1}{2}$ feet.

Bouquet Dahlias.—For decorative purposes, especially for small gardens, these possess considerable value; indeed they are useful everywhere. Adonis, rosy carmine; Burning Coal, yellow and crimson; Camelliaflora, white; Dove, white and rosy lilac; Dora, primrose and white; Emotion, lilac; Fireball, orange scarlet; Fair Helen, white and purple; Golden Nugget, yellow; German Favourite, lake; Guiding Star, white; Little Mistress, crimson; Little Nigger, maroon; Minnie, salmon and purple; Northern Light, scarlet; Rogiere Chauvier, crimson and white. The Bouquet Dahlias, or Pompone, as they are sometimes called, vary in height from 2 feet to $2\frac{1}{2}$ feet. All have neat double flowers. Some are valuable for cutting.

Single Dahlias.—Attraction, pink and lake; Argus, magenta; Darkness, mulberry; Beauty of Cambridge, crimson; Elaine, white; Evelyn, white and lilac; Francis Fell, rosy purple; Harlequin, rose and purple; Magnificence, light pink; Mrs. Burbidge, violet-purple; Ne Plus Ultra, dark crimson; Pink Queen, pink; Rob Roy, scarlet; Thalia, amaranth; Purple King, White Queen, and the semi-double Cactus in various colours, which are well adapted for planting *en masse*.

The flowers of these single varieties have a light elegant habit, and look well in the border. When pegged down they make a striking bed. They vary in height from $2\frac{1}{2}$ feet to 4 feet.

The Pansy.—To have this family really fine the ground must be deep and fairly rich, without fresh manure. The plants turn sickly, and frequently die, if strong or rank manure comes immediately into contact with their roots. Fresh turfy loam, with which has been incorporated two or three months previously a little

short stable or cowshed manure, and which has become mellow, may be used to dress the beds with advantage ; but if any fresh manure is used, bury it a foot deep at least, so that it may have parted with its chief strength before the roots reach it. To prepare a bed for Pansies, trench it up two spits deep not later than September, if it is intended to plant in autumn. Of course there must be no bad subsoil brought to the surface ; but to do Pansies well there should be 2 feet of good soil above anything that may be inferior in the bottom. If the soil is not of a first-rate character (a sound, free-working loam is the best), after the bed has been trenched, place on the top 6 inches of loam, in which a little old manure has been blended, and fork it over, mixing a little of the top soil with it. In this condition the bed may remain till the plants are ready. For obtaining fine blooms the best time to plant is not later than the third week in October. The plants, when planted thus early, get well established before frost comes to lift them out. Plant in rows across the beds, which should be 4 feet wide. The rows should be 1 foot apart, and the plants about 9 inches apart in the rows. When fresh loam is brought in, care must be exercised to prevent wireworms gaining a footing in the bed ; and in making a new bed for choice varieties it is always safest to place a few traps for wireworms if there is the least suspicion of their presence. Wireworms are very fond of Potatoes, Carrots, and other vegetable roots ; pieces may be inserted in various parts of the beds, leaving a peg or skewer to mark the spot, so that the traps can be easily examined and the wireworms destroyed. To give a successional character to Pansies, another bed may be planted towards the end of March, the ground to be trenched up roughly and exposed to the weather in winter. A cool, rather moist, and partially shaded situation is best for Pansies, though when the land has been deeply worked and top-dressed in the way suggested, the position of the bed is a matter of less importance. A dressing of clay where the soil is of a hot nature will be beneficial. Mulching and watering too with pond water are important matters. Though pains must be taken with the choice kinds to obtain really fine blooms, yet in good soil the Pansy in its hardiest form is an excellent border plant, and in a moist shady border takes complete possession of the ground ; and if top-dressed occasionally will make a handsome show without much trouble, and last for several years, renewing itself by seeds, the seedlings flowering in succession. In fact, such a border is seldom without blossoms. This is using the Pansy in a rough kind of way for its decorative value merely.

CULTURE IN POTS.—Fine well-marked flowers, free from weather stains, are usually obtained from the plants grown in pots. The

cuttings should be struck in August, potted into 3-inch pots when rooted, using good loam slightly enriched, and kept in a cold frame, having free ventilation in fine weather, the pots plunged in Cocoa-fibre. Early in April shift into 6-inch pots, and replunge in fibre. The best position for the frame is the north side of wall or fence, not quite close to the wall, but far enough to obtain full light, and retain the value of its shelter and shade during the hottest part of the day. As the plants grow, a few neat little sticks may be placed to the shoots. Any plants that do not furnish a sufficient number of breaks from the bottom to make nicely furnished plants may early in the season have their shoots pegged or layered into the soil. This will cause them to become bushy. Those who make a specialty of Pansy culture will find it an advantage to grow a selection of the best varieties in pots for seed-bearing purposes.

PROPAGATION BY CUTTINGS.—Pansy cuttings strike freely at any season of the year under suitable conditions, and when young shoots can be obtained. In summer and autumn dibble the cuttings into a prepared bed, under handlights or in a frame, in a cool shady position. It is better, in order to keep out worms, to place a layer of coal ashes 2 inches thick in the bottom, and on this place the prepared soil (sandy loam) about 5 inches deep, with a sprinkling of sand on top, or charcoal dust will do better even than sand. The Pansy, when making roots, requires to be moist, and yet it is impatient of watering, damping off if watered too freely, especially when kept close under glass; hence the importance of planting the cuttings in a cool position, where but little water will be needed. In winter and spring propagation the cuttings are better planted in pots or pans, in sandy loam, inserting the cuttings round the edges chiefly, and plunging the pots in Cocoa-fibre or sawdust, thus keeping them moist and sheltering them during the frequent changes of temperature which occur at those seasons.

Pansies may be increased by division, and are frequently treated so in common cultivation. The young shoots may be layered and lifted when rooted, and either planted in a nursery bed or taken to their final quarters at once. In the successful culture of the Pansy, to obtain blooms of fine quality a good deal depends upon the character of the soil. A loam that has a soft silky touch when rubbed between the fingers will grow them to perfection with a little old cow dung added. When grown in pots, these should be carefully drained, not too many crocks placed in the bottom, but enough to secure the free passage of the water; for though the Pansy must have moisture in abundance, yet anything approaching stagnation is death to it. Many people when told to drain a pot

well, overdo it by placing so many crocks in the bottom that the space left for soil is unnecessarily curtailed. Place one large piece over the hole in the bottom of the pot, so that the water can escape beneath and yet make it difficult for worms to enter; on this put three or four pieces of a smaller size, and then a small handful of little bits that have been broken up with a hammer and the dusty particles taken out with a sieve. Oyster or cockle shells broken with a hammer will do well for this latter purpose, but the depth altogether, if properly placed for a 6-inch pot, need not exceed $1\frac{1}{2}$ inch. I need scarcely say that dirty pots should not be used for anything till thoroughly cleansed with a brush and water.

THE SEEDS should be gathered a day or two before they are quite ripe, as they burst and the seeds are scattered. They may either be sown as soon as fully ripe or be kept till spring. The choicer kinds should be sown in pans and placed in a frame. A slight warmth till the seeds germinate will be no disadvantage, as tending to hasten matters; but as a rule the Pansy is impatient of artificial heat. Herewith I append a list of good varieties in the various classes. Whether grown in pots or in beds, liquid manure when coming into bloom is very beneficial, to be continued occasionally during the flowering season. To obtain fine flowers for any special purpose, the plants must be shaded, but continuous shading is destructive to continuous blooming. When flowers as good as can be obtained are required at some special time, all the blooms and buds should be picked off till within a fortnight of that time.

SHOW PANSIES—*Yellow Grounds*.—Bendigo, Clonard, Corsair, Captain Cowan, Ebor, George Glenny, Master Ord, Mrs. Russell, Perfection, Miss Hope, Robert Burns, Thos. H. Douglas, Walter M'Kay.

White Grounds.—Alice Downie, Duchess, Bessie M'Aslan, Ladyburn Rival, Bonny Jean, Caroline, Device, Jessie Foote, Miss Forgie, Mrs. R. B. Matthews, Princess of Wales, Mrs. Cairney, Mrs. Dancy, Nina, The Mede, Undine.

Yellow Selfs.—Brilliant, Captain Hayter, George Murray, George Rudd, Kate, King Koffee, Maranata, Martha, Miss Ross, Mrs. Horsburgh.

White Selfs.—Clara, Cupid, Emblem, Highland Mary, Jeanette, Mrs. Cannell, Mrs. Dobbie, Peerless, Mrs. Goodall.

Dark Selfs.—Ajax, A. Fox, Beacon, Black Knight, Bluestone, Captain Elder, Captain Knowles, Danger, David Malcolm, Dr. Graham, George Keith, Rev. D. Taylor, Marquis of Lorne, Prince Bismarck, Robert Parker, W. E. Gladstone, Robert Black.

FANCY PANSIES.—These are of Belgian origin, and are very

beautiful and attractive, being blotched and marked in every conceivable form and colour. A. Campbell, Alex. M'Millan, Annie Howard, Aurora, Bessie Nash, Buttercup, Cleopatra, Colonel Holmes, Dr. Holmes, Catherine Agnes, Fred. Perkins, Earl of Beaconsfield, General Grant, George Stewart, Jean Watts, John Gray, Laura, Mars, Mrs. Jamieson, Mrs. Goodwin, Mrs. Birkmyre, Mrs. Barrie, Novelty, Queen of Yellows, Miss Bliss, Orestes, Rifleman, Robert Congleton, Rosy Morn, William Dickson, William Murray.

The Pæony.—Pæonies are divided into two sections, those having herbaceous stems and deciduous foliage, and the moutan or shrubby species, which are also deciduous. Both the original species were introduced just about a hundred years ago, and have since branched off into many forms, chiefly noticeable for the many tints and shades which appear in their grand massive flowers. Most of the best herbaceous varieties have sprung from a species called albiflora, formerly known as *P. edulis*, because occasionally its roots have been eaten; but its value as an edible root is not much, though I dare say in time of great scarcity, where society is in a primitive condition, many roots and herbs not very palatable are useful to sustain life. But it is for their flowers that the Pæonies are valued now. Unfortunately, like many things which possess brilliancy of colour or nobility of aspect, the duration of their period of beauty is very limited, and for that reason they are not adapted for the parterre, where continuous gaiety is required. But this craving after things possessing a perpetual habit, to my mind, has a mischievous tendency, inasmuch as it brings all things down to one monotonous level. The prettiest gardens are those where a continual change is going on—where, as one flower is leaving us, another equally beautiful is coming on; and it is here that the merits of the Pæony will be estimated at their full value.

PLANTING IN GROUPS.—To make the most of Pæonies, plant a few in a group on some shelving hillside, where they are not overshadowed by anything else. The wild garden is just the place for displaying their beauties. The large clusters of brilliant-tinted flowers springing out of a mass of deep green foliage is one of the most effective pictures of garden scenery, and they last just long enough to satisfy without satiating. Though the Pæony is an old-fashioned flower as regards several of its varieties and species, and used to be common in old-fashioned gardens, and was an especial favourite with cottagers, yet few are aware of the many beautiful varieties which are now to be obtained from our best hardy plant nurseries. Very little need be said about their cultivation, as they will thrive in any good garden soil, rather light than heavy in texture, and of

considerable depth; indeed, their large leaves cannot find sustenance enough in a shallow soil to build up the crowns which produce the large double flowers.

PROPAGATION is effected by division of the roots in spring. They may in the case of choice kinds be cut up into single buds, but when this is done it is best to plant in the reserve garden for a year or two till they gather strength, rather than risk them in the garden or where they may be forgotten and overgrown by other things of less value. The Pæony seeds freely; even the double flowers will ripen seeds if fertilised with pollen from the single varieties, and an interesting progeny may be raised by any one having the necessary time and patience if hybridising is systematically carried out. The seeds should be sown in pots or pans placed in a close frame as soon as ripe, using a light compost of sandy peat and loam.

Herbaceous Pæonies with Double Flowers.—*Amabilis grandiflora*, creamy white; *Anemonæflora striata*, bluish yellow; *Charles Binder*, silvery rose; *Clarisse*, rosy pink; *Comte de Paris*, bluish, citron centre; *Duc de Cazes*, deep rose; *Elegans superbissima*, rosy bluish; *General Bertrand*, peach, salmon centre; *Globosa*, rose, white centre; *Lilacina superba*, rose, lilac, and saffron; *Lacteola alba*, white; *Madame Vilmorin*, deep crimson; *Mons. Andre*, rose and fawn; *Pottsi plena*, crimson; *Prolifera tricolor*, centre yellow, outer petals white; *Queen Victoria*, bluish, lemon centre; *Rosea plenissima*, centre rose nankeen, outer petals carmine; *Rubrosum*, crimson; *Sulphurea superba*, sulphur; *Tenuifolia fl.-pl.*, crimson. Many of the best varieties are of continental origin. Plant either in autumn or spring, having first deepened and enriched the soil with leaf-mould.

Tree or Moutan Pæonies.—*Alba lilacina*, white and violet; *Bijou de Chuseen*, light purple; *Blanche du Chateau Futu*, white; *Carolina*, salmon; *Charles Roper*, white; *Colonel Malcolm*, violet; *Comte de Flandres*, rose; *Elizabeth*, red; *Emilia*, carnation; *Fragrans maxima plena*, rose; *Hippolyte*, white and rose; *Lactea*, white; *Leopoldi*, rose; *Madame Stewart Low*, salmon red; *Odorata Maria*, soft rose; *Osiris*, purple; *Ranieri*, amaranthe; *Rosea Mundi*, salmon; *Rubra odorata plenissima*, lilac rose; *Samarang*, red and black; *Souvenir de Madame Knon*, white and carmine; *Triomphe de Malines*, violet; *Triomphe de Vandermaelen*, white and rose; *Rienzi*, rose.

Most of the above have double flowers, some are beautifully fragrant. The moutons, though not quite so hardy as the herbaceous varieties, will flourish in a sheltered situation in most gardens, with light rich soil. They may be increased by layering

or grafting, using the roots of the common herbaceous varieties as stocks, placing the scions on the crown ends of the tubers, then potting them and keeping them close in a frame till united. In potting, bury the junction to keep out the air. Grafting is best done in spring just before the buds break, or in summer when the wood is getting a little firm. In the latter case the roots which are to form the stocks should be kept in pots. Cuttings of the young wood getting firm in summer, taken off with a heel of old wood, and planted under a handlight in a shady border, will root, and soon form nice little plants. The moutans are beautiful in pots forced gently into blossom early in spring, the colours of the flowers coming out brighter and purer under glass than in our bleak climate; and as they naturally flower early, a very little forcing will bring them into blossom in February. They are beautiful in a cool conservatory.

Delphiniums or Larkspurs.—After a long period of neglect these, like all really good things, are coming to the front again. In the old-fashioned herbaceous border the Delphiniums were conspicuous objects; but when the rage for bedding out set in the Larkspurs were found to be unmanageable subjects, and so were discarded, and now many of those people who rooted them up are seeking them again. They are cheap enough, for a good collection may be bought now for the price of one of those little parti-coloured Geraniums of a few years ago. They are easily propagated by division of the roots or crowns, and also by cuttings and seeds. They are not particular as to soil or situation, and they are hardy enough to plant in groups in the wild garden. They usually flower in June and July, but by thinning out the shoots when a foot or so high a succession of flowering spikes are produced all the summer; and where a number of plants are used as backgrounds, by cutting down half the plants when about a foot high in June, those so treated will be coming into flower about the time the others are going off. By a little management, a long succession of their brilliant and effective spikes of flowers may be obtained. On looking through a list of varieties published in 1850 I find sixteen names mentioned there. Through the exertions of continental and our own florists, four or five times that number of varieties are now grown in good nurseries. The following list offers a good selection:—

Single-flowered Varieties.—Agamemnon, Azureum, Barlowi, Belladonna, Coronet, Cantab, Enchantress, Formosum, Hendersoni, Life Guardsman, magnificum, violacea.

Double-flowered Varieties.—Barlowi versicolor, General Ulrich, Azureum plenum, Avocat, Deliege, Hermann Stenger, Keteleeri,

Madame Henri Jacotot, Madame E. Geney, Mrs. Miller, Mrs. James Helme, Palmerston, Protée.

Chrysanthemums in the Open Air.—To obtain flowers of the *Chrysanthemum* in the highest state of perfection, shelter of some kind is necessary. But a very considerable amount of success has been secured by many amateurs without glass. In some instances the plants are grown in pots, with temporary shelter erected over them when in blossom; in others, where only a few plants are grown, they are moved into the house at the approach of cold weather, where they fill the stands and windows in a charming manner, looking bright and gay for a considerable time. The Pomponé varieties are best adapted for this work. Another way of growing them is to plant them out in the open air, pinching them occasionally in the early stages to induce a dense habit; and then in September or October, after the buds are set, run the spade round the stem, leaving a ball about as large as will fill the sized pots they are to occupy when lifted. They should be potted up just before frost sets in—towards the 20th of October is a good time. But many people grow *Chrysanthemums* simply as border plants, leaving them to take their chance without shelter or any other care or cultivation than the ordinary hardy plants receive. Occasionally very good displays are obtained in this way, and as the *Chrysanthemum* takes so kindly to a smoke-laden atmosphere, it is eminently suited for town gardens. In the course of my wanderings among the back streets of houses and cities I have often in autumn come upon pleasant little shows of *Chrysanthemums*, where the cultivators have had no other place for their plants than the few square yards in which they are blooming so prettily; but they make up for their limited means and resources by incessant care and attention,—stirring the earth among them frequently, dewing over the foliage after every hot day, pinching the gross robber shoots, and other little attentions, which the plants appreciate and respond to in the shape of glossy leaves and bright flowers. It is true that frequently all this labour is lost by one night's killing frost in November. What then? All have their failures, and it is one of the traits of the Anglo-Saxon character not to know when they are beaten, but to plod on hopefully, now and then scoring a great success which compensates for past disappointments. I have already stated that the Pomponés are best for border culture, but where a low wall has to be covered the tall kinds may be advantageously planted; indeed, a good deal more use might be made of the tall large-flowering *Chrysanthemums* for covering the bottom of walls and clothing low walls generally. The walls might

be wired and the plants tied to the wires. Many of the tall large-flowering kinds will grow 5 feet or 6 feet high in a good border well supplied with water in dry weather, and when well fed and sheltered the flowers are large in size and the colours beautifully clear. Besides, it is very easy to shelter the flowers against a wall by suspending some thin woven material, such as scrim or tiffany, over them on frosty nights. Thus treated they are perfectly safe.

I shall refer to the Chrysanthemum as a pot plant later on. I am now only thinking of it as a hardy border plant. Its hardiness in a well-drained soil is undoubted, but in consequence of its late-blooming habit the flowers are frequently discoloured and injured by the late autumn frosts. Even when regarded as a hardy border plant, the Chrysanthemums should have liberal treatment, or the bottom leaves will fall, and naked stems anywhere are objectionable. Turfy loam and old cow manure in a mellow condition will grow them to perfection; but they dissipate a good deal of moisture, and a liberal supply of water will be necessary, with occasional doses of liquid manure. The propagation is very easy; cuttings may be rooted at any time in spring and summer, or the roots will throw up a number of offsets in spring, which may be separated from the parent stool with a piece of root attached and planted elsewhere. The plant should be divided and replanted annually to obtain the best results. Being gross feeders, they consume most of the food within their reach in one season, hence the value of annual removal. To obtain small dwarf plants to fill in a bed in some prominent position, the points of the shoots may be layered towards the end of July or beginning of August by pegging them into the soil; they may be layered into pots or boxes, or be laid down and pegged into the earth which surrounds the plants in the ordinary way, to be severed from the parent plant as soon as well rooted.

Tall large-flowering Varieties for Covering low Walls.—Alfred Salter, Aurea-multiflora, Christine, Empress of India, Eve, George Glenny, Golden Beverley, Hero of Stoke Newington, John Salter, Lady Talfourd, Mrs. G. Rundle, Progne, Queen of England, and Elaine.

Pomponé Varieties for Borders.—Andromeda rosea, Bijou de Horticulture, Bob, Brown Cedo Nulli, General Canrobert, James Forsyth, La Vogue, Lilac Cedo Nulli, Model of Perfection, President, Princess Maria, Salomon, Sœur Melanie, Virginale, and Fanny.

Anemone-flowered Varieties for Borders.—Astrea, Calliope, Fleur de Marie, Marie Stuart, Mr. Astier, Rose Marguerite. The above

are fine for cutting, and they are also of a manageable size in the border.

Summer-flowering Chrysanthemums.—This is a comparatively new race, whose numbers are now considerable, and they are exceedingly useful both as border plants and also for pot culture. They begin flowering in July and continue till autumn. There is no difficulty in their cultivation, and I think they are destined to become very popular. Aureole, crimson, tipped lemon; Cassy, rose; Curiosity, lilac; Delphine Caboche, purplish rose; Frederick Pele, red; Golden Button, yellow; La Nymph, rosy purple; Le Luxembourg, bronze; Lucinda, white and lilac; Madame Desgrange, creamy white; Mdle. Jolivart, peach; Scarlet Gem, scarlet; Souvenir d'un Ami, white.

The Auricula.—I have condensed these remarks upon hardy florists' flowers into as small a compass as possible, not because the subject was unworthy of more extended treatment, but rather because I did not wish to trench upon the proper domain of the specialist. I hope I have said enough to convince those of my readers who have not yet taken up the culture of these extremely interesting families of plants, that there is a wide field open for the display of their talents and energies. And those among them who want to go farther than this book takes them can apply to the various published treatises for fuller information. But after all there are things in the culture of plants which cannot be learned from a treatise, however exhaustive it may be in its treatment. Many useful and suggestive hints may be obtained from books—even bad ones have their uses in this respect; but still experience is the best teacher, though in some respects it may be an expensive one, unless guided and controlled by what, for want of a better term, is called common sense.

THE SOIL for Auriculas, Polyanthuses, and the Primula family generally should be of a loamy nature, medium in quality—that is, not light nor yet heavy, and it should be enriched with old cow manure in proportion to its quality; from a fourth to a third will generally give good results. Some people in preparing their compost, when the loam is carted home, pack it up in a ridge with proportionate layers of cow manure in the loam. When this has been laid up six months it will, when broken up, grow in the highest state of perfection all the families treated of under the heading “Hardy Florists' Flowers.”

CULTURE IN POTS.—Auriculas of the highest class are usually grown in pots in frames, on a stage erected some distance from the ground in winter to ensure a free circulation of air—the best antidote to damp. But whether grown in frames, low pits, or houses,

damp is one of the chief enemies to guard against in their winter management. The usual time for repotting is early in February. All the plants may not require to be repotted; top-dressing with rich compost may suffice in some cases, and if the pots are large enough for the plants, and the drainage in a healthy condition, repotting is not required, as food enough can be given by top-dressing or liquid manure. All pots must be clean, especially inside, and the drainage in the bottom must be perfect to permit of an easy escape of the water, as a water-logged plant soon changes colour and dies. When the plants are in hand either for repotting or top-dressing is a good time for removing any offsets that may be growing out of the sides of the stems. Old-fashioned florists used to take them off by pressing them downwards—in this way all that belonged to them came away at once; but when a knife is used, a part is left which sometimes decays in the stem and causes injury to and destroys the plant. The rooted offsets should be potted singly in small pots, adding a little sand to the compost to lighten it. Those which possess no portion of root should be planted firmly, five or six round the sides of a 5-inch pot, and be plunged under a handlight and kept close till rooted. The plants from which the offsets have been taken should be potted deeper, so as to cover the wounded stem with soil and encourage fresh roots to break away. If, in removing the offsets, holes are made in the main stems, fill them up with powdered charcoal to keep out damp and decay.

GENERAL TREATMENT.—After potting, and indeed at all times in winter, the watering must be done with care. All this family like moisture and shade, but stagnation causes the leaves to lose colour, and an unhealthy plant is a difficult subject to deal with. The frames will require shelter in cold weather, but during winter, if a fall of snow comes, the plants may be covered up for several weeks without injury. In spring, when the days lengthen, the frame should be turned with its back to the north, as the plants will not endure bright sunshine. In summer the plants may be placed on a coal-ash bed on the north side of a building or high fence, where the rays of the sun in the middle of the day cannot penetrate. At all times when the weather is mild the most perfect ventilation is required, even to the extent on calm days of taking off the lights altogether. Light showers in the spring, when growth is proceeding, will be beneficial rather than otherwise. But if water lodges in the hearts of the plants it may do harm if not removed, either by absorption with a small bit of sponge or blowing it out; or the plant may be taken in the hand and its position reversed. The green-fly is sometimes troublesome during the grow-

ing season, and it is better to meet these pests beforehand by dusting a little Tobacco powder among the plants occasionally in the spring, or to fumigate lightly, without waiting for the fly to appear. The flower trusses will need support as they advance in growth, and if very fine flowers are sought only one spike should be left on each plant.

The work of hybridising, saving seeds, and raising seedlings where a good collection is cultivated, is most interesting; indeed no one can go properly into their culture without wishing for the general excitement of seeing a progeny springing up which in some measure owes its origin to his own hands. The seed pods should be carefully collected as they ripen, and be placed away in the condition in which they are gathered till spring, when the seeds should be sown in boxes or pans, covering lightly. A little bottom-heat will cause them to germinate more speedily, but the old florists seldom use it, preferring to trust to natural means alone. Where pains have been taken to cross different varieties, a pedigree book should be kept, otherwise we should be working in the dark. The young seedlings will not endure bright sun even for an hour, so must be constantly shaded.

These remarks, short and imperfect as they are, would not be complete without some reference to the *Auricula* and its relatives, the *Polyanthus* and *Primula*, as border plants. In a cool shady border in the early spring a perfect paradise may be created with this family alone; in fact no other distinct race is capable of doing so much to inspire affection, or clings so tightly round the hearts of those who once commence their culture; and in the open air, if the position is well selected, and if Art helps Nature as much as she can, the *Primula* garden will in spring be one of the sweetest, brightest features imaginable. The one thing to be constantly kept in mind is that *Primulas* will not thrive in the full sunshine. *Auriculas* of the alpine section are specially adapted for furnishing any cool shady corner of the rockery, where, in association with the *Cyclamen* and other shade-loving subjects, very effective groups and features may be created. In country places there are hundreds of situations where, in a natural dell, a *Primula* garden may be formed superior to anything of the kind most of us have ever yet seen. It only requires to be set about by some one full of love of the subjects and possessing some knowledge of their requirements. The expense would be very trifling in comparison with that of other forms of gardening.

The *Ranunculus*.—The *Ranunculus* of the florist is a near relative of the Buttercup of the meadow, which grows so luxuriantly in cool damp bottoms. Its great beauty during growth

and its usefulness for cutting ought to make the *Ranunculus* a popular favourite, but somehow it is not ; although admired by everybody, it is cultivated only by a few. The truth is, I suppose, that the Persian or Asiatic *Ranunculus* and its many hybrid forms, though not difficult to grow, yet demand a treatment different from the ordinary run of popular flowers. Like the Buttercup, it thrives best where the subsoil is cool and moist ; and this coolness and moisture is supplied by the methodical florist in this way. Having selected the site for the bed, he marks out its size, digs out 15 inches of the soil, taking away to another place the bad soil, if any. On the bottom of the excavation a layer of cow manure, moist and rich, from 4 inches to 6 inches in thickness, is laid. On the top of this the bed is prepared by adding fresh loam to the best of the soil excavated, if the latter is fairly suitable. And as a goodly number of varieties may be grown on a moderately-sized bed, the objection to the extra trouble only comes from the lukewarm and those who lack enthusiasm. The bed should be prepared during winter, and the surface should be left rough for the weather to work its will upon. In February, about the first or second week, according to the weather, level the surface down, rake it smooth, and draw drills with the corner of a hoe 3 inches deep and 6 inches apart. Scatter a little light compost along the drills, consisting of sharp sand and leaf-mould, and on this place the roots 4 inches apart, and rake the beds smooth again. Some people plant in autumn, and no doubt the autumn-planted beds flower earlier than those planted in spring. But the winter, when severe, often injures the plants, and the beds look patchy. Still, in warm dry situations, autumn planting succeeds very well in careful hands. The *Ranunculus*, when planted in spring, commences growth at once, and speedily shows above ground. If watering is necessary, as in most seasons during spells of dry weather it will be, do not wet the foliage more than can be avoided, but pour the water between the rows. A light mulching will be beneficial if the drought continues. As soon as the flowers begin to expand a shade should be erected over the bed if they are to appear at their best ; and as the flowering is past and the growth ripened, or say towards the end of July, lift and store them away ; but before doing so separate any roots that may seem to require it, as they are then less likely to break than when quite dry. They should be packed away in a dry cool place to keep them in a nice fresh condition.

The Tulip.—Florists' Tulips are generally divided into four main sections :—

1. *Bizarres*, which have a yellow ground, shaded with dark

red or purple; these again are subdivided, according to the markings. If the red or purple rise from the bottom of the petal in a broad stripe or band it is said to be "flaked;" but if the dark colour forms an edging round the margin of the petals, and at the same time descends them in a series of little delicate feathery veins, it is said to be "feathered."

2. *Bybloemens*, which have white grounds, shaded with dark purple, and are also, as in the preceding section, subdivided into flamed and feathered forms.

3. *Roses*.—White grounds, shaded with rose colour or cherry red, and also grouped in two subsections, as flaked and feathered.

4. *Selfs*, being either a pure yellow or white. The beds for Tulips should be prepared by turning over and intermixing towards the end of September or earlier, if not occupied with other plants. Loam and manure should be well blended with the soil of the bed. The offsets and the small bulbs may be planted in October, and the main bed of flowering bulbs in November, picking a suitable opportunity when the soil works freely. Each bulb should have a space of 8 inches or 9 inches square, and they may either stand quincunx fashion or be lined each way. The bulbs should be covered about 4 inches deep. A good deal of care and attention is necessary to obtain the successful results which are generally secured by the florist who makes the Tulip a specialty. Everything that may lead to damp and decay is removed from the little spear-shaped green heads as they emerge from the soil, and none but those who have experienced similar feelings can realise how anxiously they are looked for, to ascertain if any are awaiting in the extended ranks ranged with mathematical precision along the bed. Then as the days lengthen, and the cold becomes more intense, what troubles are encountered in finding and applying shelter, so that not a leaf may be discoloured! Tulips are and may be cultivated without all this trouble, but nothing but the best will satisfy the enthusiast. As the flower spikes advance they must be supported in some way, but the ties should not be too tight. Though the Tulip mania is never likely to return again, still a good seedling Tulip is worth money, and even if it was not, seedlings would be raised from a love of the work and the interest which it inspires. The crossing of two good flowers will be productive of something good. All flowers operated on should be distinctively marked. When the flowering is over, the seed gathered, and the growth ripened, the bulbs should be taken up and placed in some dry airy room or building to finish off their ripening, preparatory to being sorted, cleaned, and put away till planting time comes round again. I have only given the merest

outline to meet the wants of the cultivator who simply wants a showy bed. To obtain quality of flower and correctness of marking, too much manure must not be used ; still the soil should be rich, mellow, and sweet, and during the growing season the surface of the bed must be frequently stirred.

CHAPTER XVIII

Routine Work.—To manage a garden successfully there must be method and routine, for people who do things in a haphazard kind of way never succeed, or at least never obtain that full measure of success which is granted to the methodical man. Year after year, as spring follows winter, and summer and autumn complete the circle of the seasons, each period brings its work, which if neglected tends to drive things into a corner, from which there is no extrication without making a sacrifice. Some people think and say that there is not much to do in a garden in winter, but many operations of a preparatory character can only be done profitably at that season. The trenching or deepening of the beds and borders is especially winter work. The transplanting of deciduous trees and shrubs, the relaying of turf, the making and renewal of gravel walks and roads, and many other operations, can be done better in winter than summer, and have a great influence upon the appearance and comfort of the place. Take, for instance, gravel paths and roads. If in bad condition, the place always wears a neglected look, which nothing can remove till the omission is made good. In some places new gravel comes expensive, but if the worn path is turned over with a steel fork, and a few stones placed beneath the worn place to lift it up a little, the walk will be placed in a condition as good as new without any expense beyond the cost of labour. Walks that are turned over annually, if they contain from 4 to 5 inches in depth of gravel, will always be in good repair and have a fresh, bright, clean surface if well rolled when damp. The surface of the path should be put into shape, with the right inclination to throw off the rain to the sides, as soon as the gravel has been turned ; and it should be made firm first by treading, afterwards by drawing a heavy roller over it several times, till the whole has become hard and solid. With a little attention afterwards the walks may be kept in good condition, and the weeds in a well-managed walk are less troublesome than when the surface is uneven and damp from wear. Again, routine, or the art of doing the right thing

at the right time, is always noticeable in the proper management of

The Turf of the Lawn.—A rough, coarse, weedy lawn is always a trouble and an eyesore. Moss may not be so objectionable if there is not too much of it, but where the roller and the mowing machine are used with care and judgment, Moss will not accumulate to an injurious extent. There are places, such as under trees where the shade is dense and the Grass will not grow, in which the presence of Moss is useful and agreeable ; but, generally, speaking, in an open lawn the presence of Moss is a sign of poverty in the soil, or else draining is required ; and when we consider that in the majority of gardens the mowing machine goes its weekly round, cutting the Grass down close to the roots, and in dry weather almost stubbing them up, is it any wonder that the Grasses die and wear out, and that Moss takes their place ?

In most gardens, especially those of small or moderate extent, the mowing machines are set too low. The lawn would look better if the Grass were not cut quite so short. If the Grass was left, say an inch long, the roots of the plants would feel comfortable under the shade provided, and would not burn so quickly at the approach of the first spell of bright sunshine. So self-evident is this, that some have adopted the plan of setting the machine to cut a little higher. It is only a question of dropping the rollers in front of the cutters (and most machines are provided with these now) down a little. The machine will work easier, and the lawn will look better. There will be a saving of wear and tear, and the result will be more satisfactory. The American system of scattering the cut Grass over the lawn does not answer in our climate, as it encourages the weeds, especially the Daisies, to a most alarming extent. Top-dressings of wood-ashes and soot are exceedingly beneficial to a weakly turf ; and though a thick turf may not need extra support, yet in the course of time, even on the best soils, some help must be given in the shape of manure ; for a system of close cutting, and taking everything away and bringing nothing back, must in time have an exhaustive effect ; and if help is given in time, very light dressings in winter will suffice to keep the turf in good order.

Manuring Flower Beds.—Flowers need support as much as vegetables, and many flowering plants take a good deal out of the soil. But too often the necessity for manuring is overlooked till the plants become weakly. A stitch in time saves nine in this as in all other matters. I generally give a light dressing of manure every autumn, when the bedding plants are cleared off. Beds that are devoted solely to bedding out should have the manurial dress-

ing to suit the succeeding crops. Verbenas, Asters, Stocks, etc., require to be treated liberally, but a very light dressing will suffice for Geraniums, as, if the beds are too rich, the plants grow too much at the expense of the blossoms. If all the waste matters from the flower garden are saved and placed in some receptacle where a slow decomposition takes place, a sufficient accumulation of manure will be had for the annual dressing without aid from any other source. The best plan is to dig a hole in some secluded corner, and put everything usually classed as rubbish into it. Towards the autumn turn the deposit over and intermix, adding a little lime and soot. This is an excellent compost for all kinds of herbaceous plants, also for top-dressing the rockery; in fact, when thoroughly decomposed, it will not come amiss anywhere if help be needed.

The struggle with insects must be incessant. There must be no respite during the growing season if the plants are to appear at their best. One of the best modes of fighting insects is to encourage the plant to make a strong, vigorous, healthy growth. There is something about a healthy plant insects do not like; they may hover round it, but make no effectual lodgment, whilst a plant somewhat delicate is overwhelmed at once. Health is largely a question of diet, and a large amount of trouble in physic-ing and killing insects would be saved if the habits of the plants were studied and the right kind of food provided in sufficient quantities. But in a climate so variable as ours, I grant even well-nourished plants do sometimes fall a prey to insects, and it becomes necessary to attack them. The aphides are the most numerous and troublesome. Maggots, weevils, and beetles affect certain plants, and nibble away at their leaves, but they do not come in such numbers, nor multiply so fast, as the little bothering flies do, which settle on the young shoots and foliage, sucking out their life-blood if not speedily dislodged. Luckily, if taken in time, before the curling foliage encloses them in, they are easily destroyed. Tobacco, either as a wash or in powder, is instant death to them. The wash can be obtained from the manufactory at about a shilling per gallon, and one gallon will make six strong enough to kill aphides when applied with the sponge. A little soft soap may be added, and soft soap alone; two ounces to the gallon will be sufficient in light cases, but a good deal depends upon taking up the matter in time, when the first fly appears—hence the need for watchfulness. The number of insecticides are endless, but if one did not mind a little extra labour, a good syringe or garden engine and a supply of clean water would suffice if the first suggestion I made of feeding the

plants well was generally acted on. Tobacco dust or powder is a very good and cheap insecticide, and is easily applied. Too often a feeling of carelessness is present—a procrastinating habit—which puts off till to-morrow what ought to be done to-day. And to make a liquid wash requires time and trouble. Perhaps there is no hot water handy to dissolve the soap, or something or other stands in the way ; but, with the powder, the thing is so handy and easily and quickly applied, that even a man without much perseverance can get through it. Gishurst compound, 3 ounces to the gallon, dissolved in warm water and applied through the syringe, or Quassia chips, 3 ounces to the gallon, immersed in boiling water, will kill all kinds of aphids cheaply ; but, as I said before, prevention is better than cure, and preventive measures should all tend to the encouragement of growth.

Watering and Mulching.—A supply of water is a necessity in gardening. Of late years the watering-pot has not been called into use so much as formerly ; but doubtless in due course sunshine and warmth will come again. But, except in the case of recently-planted things, or plants grown in pots or in a limited root space, watering is not an unmixed good—indeed, in some hands it might do harm. On a porous soil we are obliged to water when hot weather sets in, but it is as well to defer it as long as possible, and to this end mulching comes in most fittingly. Now, mulching may be done in various ways. Where plants need more nourishment than ordinary water contains, a covering of manure over the surface two or three inches thick will give it, and at the same time keep the earth cool and moist by arresting the escape of the water by evaporation in the usual way. A mulch of short Grass, Cocoa-fibre, tan, sawdust, partly decomposed, and other substances of a like nature, has a value in hot seasons when the earth is baked and parched with drought. A still simpler form of mulch is to keep a couple of inches of the surface-soil loose by frequent stirring. Where the land has been kept in good heart and deeply cultivated, this mulch of loose surface-soil is very efficient. But still, with all these aids to good cultivation, during a prolonged drought many things may require watering, and when this becomes necessary, do it in the evening, and do it thoroughly, *i.e.* water until the roots are all moistened, and then the next morning early take a Dutch hoe and loosen up the surface to keep the ground from baking and cracking, and let all the water escape directly the rays of a hot sun strike upon it. Too much watering washes away all the fertility from the soil ; therefore, if it should be necessary during hot weather to water anything very often, liquid manure should be given every third watering to keep the

land from deteriorating, or else the beds should be mulched with manure. But in writing about insects attacking plants severely, I laid much stress upon the value of good culture as an aid to that vigour which ensures freedom from such attacks; and the same principle holds good in the case of plants suffering from drought. Deepen the soil by every available means. This is work that can be done in winter. When some people think nothing can be done in the garden, the good cultivator is thinking about collecting materials for giving a greater depth of soil to the poor or shallow beds, to enable the plants growing in them to withstand heat and drought in the future, and scarcely anything comes amiss if it will decay. The scorings of ditches mixed with lime is a good dressing for poor shallow soils. The dressing should, as far as possible, supply what is lacking in the bed or border; thus light materials may be given to heavy soil, and *vice versâ*. A celebrated artist, we are told, when asked what he mixed his colours with, replied, "With brains, sir;" and the exercise of the principle which is implied here is required, perhaps, in the cultivation of the soil more frequently than in any other occupation of life; and when we consider that the chief necessities of life—food and clothing—are obtained by the cultivation of the earth's surface, and that men of commerce, who look upon themselves as the salt of the earth, are only middlemen or agents between the producer and consumer—if we have a right appreciation of these things, we shall see how important it is for us to know something about the structure and character of the soil, so as more effectively to supply its necessities.

Planting Flowers.—Plants feel pain when ill-used, or at least they show symptoms of suffering when any of the conditions under which they usually live when in health are absent or imperfectly carried out. In planting out anything that has been growing in a pot—and nurserymen, for the convenience of removal, keep a large number of things in pots which, under other circumstances, would not be potted—if it is possible to open out the roots a bit before planting, and the plant is intended to have any degree of permanency, that would be an advantage. In planting out a tree or shrub, for instance: if the ball has been confined to a small pot, and it is committed to the ground without opening up a little, the chances are that, even if the soil and situation are in all respects suitable, the tree will not have a long life, or get sufficient grasp of the soil to stand much wind pressure. Young plants that have been kept steadily moving on in pots start at once when turned out. The real evils of potting are only found when the plants get what is termed pot-bound, and the roots, from long residence in a

small pot, assume a spiral or corkscrew form, which they seldom lose, even when planted out under the most favourable conditions. Therefore, in buying trees or shrubs in pots, it should be seen that the roots are in a fresh, healthy condition. In cases of soft-wooded plants this objection does not apply, or at least only to a limited extent. It is true that an old pot-bound *Geranium* does not transplant so well as a young one, but that is simply the fulfilment of a law of Nature, which applies with equal force to all living things. Plants have such a large amount of recuperative force that even if, in transplanting, less intelligence and care is brought to bear than the case requires, beyond a little time wasted in starting no harm seems to be done if the treatment is right afterwards. But in looking at a person planting flowers it is easy to see if there is any bond of sympathy between the planter and the living things he is operating on. And when plants fail to thrive, the reason should be sought for in the treatment they have received, and no mere mechanical worker will be so successful as the one who has learned to love the tender things he works and cares for. Love is continually seeking for opportunities of doing good to the object of its affection. The mechanic simply puts in the plant and forgets everything else. In the simple operation of making a hole in the ground and planting a *Geranium*, there is more than appears on the surface to the casual observer. The hole must be of the proper depth and width, and the right amount of pressure must be used. Some time ago I was looking over a garden fence at a man planting; he was anxious to get his job over, being, as I expect, paid by the piece. How often, in his hurry, he made the holes too shallow, and then tried by an extra amount of pressure upon the ball to drive it home; but planting a flower is not like loading a gun, and it generally resents such treatment. The hole should be deep enough and of sufficient capacity to take in the ball comfortably. Sufficient pressure to fix the plant firmly in the ground is necessary, but it should not be applied so roughly as to run the risk of breaking up the ball, which would rupture the roots and be a serious check upon progress.

STAKING AND TYING FLOWERS.—This is work which should be done by anticipation, as it were, as a blown-down plant cannot be put back in exactly the same position again. Neither the stake nor the tie adds anything to the beauty of the plant, and should be employed only just so far as they are necessary; and this refers to all flowers alike. The stake should be placed at the back of the plant, or, if there are many flowering shoots, it will be better in the centre, so that they can be linked up loosely all round. It takes a little more time, perhaps, to tie up a *Phlox*, or any

other plant producing several flower-spikes from one root—to link each stem up separately in an easy-flowing manner, where the motion of the air can be felt by the branches—than to tie them up in a bundle either with or without a stick in the middle; but otherwise there is no question as to which plan is best, and these bundled up flowers soon wither and die, for, lacking air, the leaves turn yellow and rot the stems if rain comes. In tying up anything that is in the midst of growth, such as Dahlias for instance, room must be left for the stem to swell; much injury is done by the inexperienced through forgetfulness of the rapid way in which the stems of some plants grow in early summer. Another disadvantage of the bundle system is, that the strings are sure to give way during a windy time, and the plant be blown down and spoiled for the season. The best and cheapest material for tying flowers is the foliage of a kind of Grass or leaf called *Raffia*. It is very strong when twisted, and will last one season very well.

STOPPING SUMMER GROWTHS.—Some people think the unstopped plant becomes stronger than the one that is pruned or pinched. Acting on this principle, a neighbour who had made a new lawn by sowing Grass seeds refused to allow his man to cut the young Grasses till they had grown up into flower, and then was surprised to find how bare and naked the ground was when at last he had them mown. In planting a forest tree let the leader grow unstopped; but with many plants, if beauty of outline is required, more or less of pinching is necessary in order to get that dense bushy habit which is required for covering the ground quickly. Then, again, modern ideas of gardening, especially in summer, require a great blaze of blossoms at some particular time—when the family returns from the metropolis or some foreign excursion, and pinching enables us to time the thing so as to get a grand display for the home-coming. We all know how first impressions cling to and linger with us. All pinching or stopping in summer should be done when simply removing the terminal bud will suffice; then the plant feels little or no check, the pair of buds just beneath break into growth, and we have just about double the number of shoots striking upwards which the unstopped plant possessed; and by and by there will be, in all probability, just double the number of flowering shoots which the plant would have borne if it had been left alone. But this pinching must be applied judiciously: to apply the principle indiscriminately would, in many cases, be unsatisfactory in its results. For instance, to pinch a *Dahlia*, or a *Phlox*, or a *Hollyhock*, would lessen the plant's nobility of aspect by decreasing the size of the flower-spike and altering its

character and outline. Who would ever think, for instance, of pinching the flowering growth of the Yucca, or a similar plant? But the Chrysanthemum, the Paris Daisy, and many annuals of loose habit, are improved and made more effective by nipping off the points of straggling shoots before they get away too far. To be of advantage, pinching must be done before the shoots extend much.

SAVING AND GATHERING SEEDS.—There is a good deal of interest excited by raising seedling flowers, especially when they have been fertilised by our own hands with strange pollen, in order to obtain a new and distinct progeny. It is true, disappointments are numerous; and no man, not even the least sanguine perhaps, ever obtains his ideal; but success of some kind will surely be given to all who deserve it by holding on to the end. Many of the best Roses and other things have been obtained from flowers which have not been artificially hybridised. A collection of the best-known varieties has been placed in the same garden near each other, and the seeds from the lot planted and grown on together till they flowered. In many cases the parentage of new flowers can be distinctly traced in their appearance. Apart from the interest attached to the raising of new varieties of plants by hybridising, a good deal of useful work may be done by selection, and in maintaining purity of stock in any good old-fashioned flowers that everybody grows or would like to grow. All seeds should be gathered when dry, and just before they are ripe, but with sufficient sap in the outer covering of all the pods to complete the process of ripening. When gathered, the pods should be placed in saucers or in paper-lined boxes in an airy room for a week or longer, till the seeds are thoroughly ripened, when they may be rubbed out, cleaned, placed in packets, and stored away in a drawer in a dry cool place till the season for sowing comes round, whether that be in autumn or spring. As a rule, most of the flower and other seeds are sown in spring; and though that is the custom, it does not follow that in every case it is the most suitable time—in truth, many of what are called hardy annuals make stronger and better plants if sown in autumn as soon as ripe. In the case of most things, new seeds are better than old ones, though nearly all seeds will grow very well the second year. A growth of 75 per cent, even of new seeds, is not a bad percentage, as in all families there are weaklings, and of course every year the percentage decreases; but in the preservation of the vitality of a seed much depends upon its being kept dry and cool.

DESTROYING WEEDS.—The old adage, “One year’s seeding makes seven years’ weeding,” is not far from being true, and it

costs more to have a garden weedy than to keep it clean, unless it is allowed to run wild altogether with no useful crops in it. When weeds get the upper hand, one must always be weeding and yet never be clean, because when the land has become foul, no sooner is one crop rooted up or hoed down than another springs up in its place. If the weedy beds are trenched up deeply in winter, burying the surface in the bottom, many of the weeds and their seeds will perish. Salt sprinkled evenly over the surface of weedy ground or walks will speedily kill the weeds. It is more effective in fine bright weather, and must not be applied near anything in the shape of a tree, shrub, or plant of any value, as if given strong enough to kill weeds it will kill anything. The Dutch hoe in the hands of an industrious man is the best weapon for fighting the weeds with when the surface is dry; of course it is of no use hoeing when wet. Catch the weeds when they are germinating or in an infant state, and stir up and expose the surface on a warm sunny day. This should be done often, for it is wonderful, if left to themselves for a short time, how the weeds rise up again. Besides, land that is full of weeds soon becomes a breeding ground for all kinds of garden enemies. Snails and slugs abound in slovenly gardens, for they dislike the disturbing influence of the hoe, and will either perish or take themselves off. It requires a good deal of determination to take in hand and clear a weedy garden, but it can be done by constantly fighting the weeds when they are small with the hoe and the fork. In hoeing, the whole surface must be stirred; it is not sufficient to thrust in the hoe here and there, making believe of stirring it all, but not actually doing so. I suppose weeds were sent to punish the procrastinator and the sluggard. Those who take time by the forelock are not much bothered with them, and the frequent stirring of the soil which is necessary to keep down the weeds has a wonderful effect upon the growth of all cultivated plants. I consider that an abundant use of the hoe, apart from destroying weeds, pays for the labour in the extra value of the crop.

RUSTIC SEATS AND SUMMER-HOUSES.—These are only really used in summer, for people do not care to sit in the open air in wet or cold weather. This fact being recognised, it will, I think, be conceded that the correct site for such embellishments should be sought for in some retired spot sheltered from the midday sun, partially embowered in tree foliage or smothered with climbing Roses or other creepers. Weeping trees, such as the Ash, Lime, or Willow, are appropriate shelters for rustic seats. Any spot from which a fine view can be obtained forms a suitable site for a

rustic summer-house or seat ; but even then the back should be hidden amid foliage, the front and the roof only peeping out. The placing of movable chairs of more or less ornamental character and design about the gardens or grounds is a different matter, and as they can be shifted from place to place easily, there is no question of principle in the matter.

PART II

CHAPTER I

THE PLANT HOUSES

IN villa gardens of the first class, where glasshouses of various kinds are required for plant culture, there will be a saving of space and expense (and they may be arranged in a manner better adapted to meet their several requirements) if, when selecting the site, every possible contingency is taken into consideration. There are many gardens where convenience and also general effect have been sacrificed by omitting to take a comprehensive view of probable wants at the outset. This may have been the fault of incompetent advisers; but every man who builds a greenhouse, or any other glass structure, ought to ask himself this question, Will the site I have chosen bear expansion, and can I conveniently add to it if I wish? Nine out of every ten men who commence plant-growing in earnest find themselves, as years roll on, extending their glass erections. It is true that of late years the reduction of the mania for bedding out brilliant exotics has relieved the pressure upon the glass department; still, in the main, the glass erections in every garden increase in number; but even if they do not, it is as well to have plenty of room: if the space is not required for building on it can be put to some other profitable use. In selecting the site for a block of houses there should be an outfall for drainage, and, if possible, some shelter from north and east winds. For plant-growing, span-roofed houses running north and south are best, and if several are required, place them on a sort of platform in parallel lines. There is often much time lost in moving plants from one house to another, and in attending to the necessary work in connection therewith, when some distance inter-

venes between the different houses. The cost of heating, too, is generally less when they are erected in a compact group or block than when scattered. The best materials and workmanship will in the long run be the cheapest, and the ventilation should be as perfect and as quickly applied as machinery and skill can make it. In the old days that I remember so well, a man had to go from light to light, carrying a long stick with him, as he might have to give the light a good shake with it before it would move. Often the stick would slip if the operator was clumsy, then a hole appeared in the glass, and the glazier had to be called in. Now, in all modern erections, a whole house can be ventilated by just moving a lever.

THE ANNUAL EXPENSE of repairing and maintaining the glass-houses in a first-class villa-garden is considerable, and any system of construction which tends to reduce expenditure on this item without any sacrifice of efficiency must ultimately win its way. Several systems for the attainment of this object have been introduced of late years, whereby the roofs of glasshouses may be so constructed as to place all the perishable materials under the cover of the glass—nothing but the glass and the metal bars on which it rests being exposed to the weather; and putty, that greatest of all nuisances in hothouse building, is entirely absent. I feel convinced that in the future horticultural buildings can and will be constructed on some improved system, whereby the enormous expenses of painting and repairs may be much reduced. Active minds are giving close attention to this matter, and sooner or later the problem will be worked out and brought to a satisfactory issue. Several systems embodying these ideas to some extent are in operation, and any one desirous of testing or getting further information on the subject will meet with every facility for doing so. No one, I think, can look upon the present system of fixing the glass in position by so inelastic a substance and one so liable to crack and peel off as putty, as perfect. It did better when the timbers of the roof were heavy, and the rabbets on which the small squares of glass rested were wide; but that era has been left behind, and putty in connection with the roofs of hothouses ought to disappear, as it is not adapted for the larger squares of glass and lighter timbers in use at the present day. Something more elastic and enduring is required. After the putty has cracked (and the action of the wind in a gale may—in fact, does—cause putty to crack), if it does not peel off directly it is worse than useless in keeping out water, as it holds the water back, and in a measure conducts it inside the house instead of facilitating its escape.

THE CONSERVATORY.—In gardens of the first or second class the conservatory is generally a special feature near the house, occasionally being joined to or connected with it by a glass-covered colonnade. Usually its architectural features are in unison with the mansion, as there should be harmony in such matters. Conservatories of moderate size should have the roof formed with a single span, and the proportions of the building should harmonise, *i.e.* its height, length, and width should bear some proportion to each other. A flat dumpy roof on a tall building, when placed in a prominent position, is always an eyesore. If the conservatory be of considerable size, then the single span will hardly do. It will be better to break it up into several spans on the ridge and furrow principle. The arrangement of the interior is a matter of some moment, and will require careful consideration in connection with the other items of garden arrangement. For instance, there are many conservatories in the country which are exceedingly difficult and expensive to manage and keep in order, for they are dismal places, in which flowering plants will not live in winter. Palms and Tree Ferns are the only things which really succeed in such places. Very few conservatories are well adapted for the growth of flowering plants, and in arranging the interior it should be borne in mind that to build a conservatory to be kept gay at all seasons will necessitate a number of houses for growing plants in some other position in order to have a constant supply coming on. Such a house can be made most interesting, but the expense will be considerable. If a number of glasshouses exist elsewhere for the growth of plants for the conservatory, the permanent features of the latter house may be confined to the creepers on the roof and on the back wall, and the backgrounds or centres, which might be formed of large specimen Camellias, or Palms, or Tree Ferns, or some plants which will develop into grand specimens. Some time ago I was in a conservatory where the scarlet Indian *Rhododendron arboreum* formed a prominent object. A few such plants form centres round which the brilliant flowers may be grouped very effectively. *Dracaena indivisa* and *Grevillea robusta* are excellent plants to form centres in a conservatory border. The *Grevillea* requires a little pruning to keep it in bounds. If there are but few houses for growing flowers to keep up the show in the conservatory, the space for their occupation must be curtailed likewise by increasing the permanent features of the house, *i.e.* by planting up more of the space. In the arrangement of the interior of the conservatory, the purpose for which the house is required must carry weight. If for a promenade, then good broad paths will be necessary.

In some cases there may only be the borders for creepers, and perhaps a few specimens which may stand isolated, some pains being taken with their training and management to have them as perfect as possible. I remember seeing a feature of this kind in Devonshire worked out in the following manner: An avenue of Camellias—very fine specimens—had been formed by building circular brick spaces, edged with terra cotta, on each side of the back path; and the house being a large one, the effect was good. The visitor walking along the back path seemed to be in a dense but orderly-arranged grove or avenue of Camellias, whilst from the front of the house these formed a delightful, dark background for the flowering plants to rest against. When a good deal of the space must be reserved for a promenade, movable or ornamental stands may be used with advantage for the flowering plants, and if they are of various heights, more variety will be obtained. Thus a group of Fuchsias or Pelargoniums, or Ferns or Palms, will at one time form prominent objects; at another, mixtures may be used. In short there is no limit to the modes in which plants can be grouped and arranged. A thoughtful person may constantly find new sources of pleasure in the variations which can be worked out. Many a time I have gone into a conservatory feeling weary and dissatisfied with its arrangement. I have thrown off my coat, made a fresh cast of the materials, formed new groups and outlines, and lo! a transformation has occurred which has put all concerned into good humour again. Cowper must have experienced a similar feeling when he wrote—

“Prospects, however lovely, may be seen
Till half their beauties fade.”

In a large house the creepers will form one of the most ornamental and important features. The Passion Flowers alone, and their allied group, the Tacsonias, with their dangling wreaths of starry blossoms, will be a strong point where there is room for them to extend. The *Lapagerias alba* and *rubra* planted in a bed of rough fibry peat, Fuchsias, Scarlet Pelargoniums, the old Oak leaf and other scented Geraniums, Tea Roses, and many other plants which are suitable either to train up the rafters or for clothing walls or pillars, will also brighten up any structure wherein they may be used. If there should be a dark corner anywhere, build up a rockery and plant it with Ferns, selecting a spreading kind, like *Woodwardia radicans*, for the highest peak. The variegated Reed, *Arundo Donax variegata*, when planted in the border of the conservatory, has a very striking effect. I have seen it make growths from 12 to 15 feet high in one season. This plant is rather too

tender for the open air, except in the most sheltered places, and even there it frequently loses its freshness before the summer is over ; but in a cool conservatory, well supplied with water, it is quite at home. The best

MATERIALS FOR PATHS are Minton tiles ; they are always clean, and do not generate dust. The soil for the borders should be chiefly loam and peat. All bits of Fern root or stick which, in its decay, may generate fungus, should be taken away when the soil is being prepared. The soil as it is placed in position should be made firm to prevent too much settling after the plants are in. Some settlement there will be, no matter what is done ; but if valuable plants such as specimen Camellias or choice Rhododendrons are planted in loose soil, there is a danger of their getting too low down in the border, and if the collar of the plant is covered too much the plants will turn yellow and die. I have no doubt that a good deal of mischief is done in this way in the planting of new conservatories. Whenever a specimen of considerable size in a conservatory border looks sickly, examine the stem and see how deep the plant is in the ground ; if the collar is buried lifting alone can save its life. If the garden is small—that is, comparatively, and there are no relays of plants coming on elsewhere for the conservatory ; if the latter has in a great measure to be self-supporting ; and if, in addition, there is no staff of gardeners to attend to the wants of the plants—then I think it will be much the best way to plant most of them out in the borders, only leaving spots here and there for groups of Geraniums in summer, and for bulbs, Cinerarias, and Primulas in winter and spring. If good loam can be obtained, the borders should be made up chiefly with it. Lighter, richer compost will produce too rapid growth. Short-jointed wood is better for flowering than more rapid elongation, and under such conditions the plants do not get out of hand so soon, which is an important requisite in a house of the character under consideration.

THE HEATING AND VENTILATING of the conservatory are very important matters ; a good deal of the success of the house—viewed as a show house—depends upon these matters being rightly carried out. The winter night-temperature, if the house is to be a home for forced flowers, with an occasional consignment on party nights from the stove, should not fall much below 50°, or say 45° as the minimum. The day temperature should be 10° or so higher, or a little more with sunshine. Where forced flowers are not introduced, and no special effort is made to keep the house gay in winter, a much lower temperature will suffice. As regards ventilation, no hard or fast rule should be followed. Ventilate freely

when the outside atmosphere is mild and calm, but keep out all cold winds. In the matter of both heating and ventilating, a good deal must be left to the cultivator's intelligence. Speaking generally, a great deal more coal and coke is burned than is necessary, and the atmosphere of the conservatory might, with advantage, be changed more frequently. A very small aperture in two or three places will set up a circulation of air early in the morning, and carry off all impurities which have accumulated during the night. I am not going to recommend any special boiler, beyond saying that for large places I am in favour of the improved tubular form ; but almost any kind of boiler will do good work if properly set and looked after, especially in keeping the flues clean.

LIST OF PLANTS FOR CONSERVATORY.—I am speaking now more especially of the permanent plants, *i.e.* such as are planted in the borders to form the main features ; those for forcing and other purposes will be referred to under their proper headings. In some large gardens I know Camellias occupy a house to themselves, and as they are hardy in our climate and only require protection for the flowers, they are well adapted for the unheated house, which, with Indian Rhododendrons, Azaleas, etc., may be made very gay. Oranges, again, occasionally have a house to themselves, and in fact to do them well it is desirable that they should have a separate house, though at the same time they will grow in a mixed collection. The best lot of home-grown Lemons I ever saw were planted out in a Muscat vinery and trained on the back wall. In the same way Oranges have done well on the back walls of the Peach-house. I was in a conservatory lately where a large part of the back wall was covered with Orange trees trained-in close to the wall, and they were covered with fruit approaching maturity. All the hybrid Abutilons are pretty, and succeed well planted out in the conservatory border, growing and flowering all the winter. A selection of Acacias will be very suitable for a large house. I name half a dozen : *Grandis*, *longifolia* *magnifica*, *platyptera*, *verticillata*, *armata*, and *Drummondi*. *Araucaria Bidwilli*, *Arundo Donax* *variegata*, *Bambusa viridi-glaucescens*, *Brugmansia suaveolens*, *B. sanguinea*, Camellias in variety, *Casuarina sumatrana*, *Citrus* in variety. *Cytisus racemosus* is a very useful plant turned out in the border. I have had it as a standard in the border, have trained it on walls, arches, and pillars, and it is nearly always in flower. *Daphne indica*, *alba*, and others, succeed with less trouble planted out than in pots. *Dracæna indivisa*, *Eutaxia floribunda*, *Ficus australis*, Fuchsias in great variety, *Grevillea robusta*, *Habrothamnus fasciculatus* and others, *Luculia gratissima*, *Magnolia fuscata*, *Musa Ensete*, Myrtles, *Nerium* (Oleander) various, *Plumbago*

capensis, *Polygala Dalmasiana*, *Sparmannia africana*. There are numbers of Palms which will thrive in a greenhouse temperature, such as *Seaforthia elegans*, *Latania borbonica*, *Corypha australis*, *Kentia australis*, *Pritchardia filamentosa*, *Areca rubra*, etc. The Australian Tree Ferns are also grand plants for a large conservatory. *Rhododendrons* in variety. The Indian species are worth culture under glass, and a few choice hybrids which have sprung from them are good also for the same purpose. *Veronica Andersoni* is not often planted out in the conservatory, but it is well worth a place, as it flowers freely, and makes a very handsome specimen too, with a little pinching when young. I have had large cone-shaped plants 7 feet high. This list might be very much extended, but I am aiming at selections only.

CONSERVATORY CLIMBERS.—*Acacia Riceana*, *Clematis indivisa*, *C. Miss Martin*, *Clianthus magnificus*, *Habrothamnus elegans*, *Jasminum grandiflorum*, *Lapageria alba*, *L. rubra*, *Mandevilla suaveolens*, *Passiflora Count Nesselrode*, *P. Belotti*, *P. Empress Eugénie*, *Tacsonia exoniensis*. *Fuchsias* have a good effect dangling from the roof. The climbing *Tropæolums* of the Lobbium section are also most useful, especially in winter and spring, when the Passion Flowers are cut back and there is not much blossom.

PLANTS FOR BASKETS.—Ivy-leaf *Pelargoniums* (various), *Petunias* in variety, *Fuchsias* ditto, *Tropæolum Fireball* and others, *Convolvulus mauritanicus* and others, *Cissus antarcticus*, *Clematis* (various), *Cobæa scandens variegata*, *Coprosma Baueriana variegata*, *Epiphyllum truncatum* and others. The *Epiphyllums* are striking plants for basket work, and the light which in such a position falls on them ripens their growth, and induces them to flower very freely. After the growth is completed in spring, less water should be given—not, of course, to dry them off, but to rest them a little. *Isolepis gracilis*, *Saxifraga sarmentosa*, *Sedum carneum variegatum*, *Selaginella denticulata* and others, *Tradescantia zebrina*, *T. vittata*. The last half dozen plants will be found useful to cover the basket beneath a taller larger-growing subject. Nearly all Ferns may be grown in baskets. I once saw a very interesting collection, including a great many of the Maiden-hairs or *Adiantums* grown in baskets and hung against the face of the back wall of a large dark conservatory, instead of covering it with climbers in the usual way. The effect was novel and pleasing, but involved a good deal of work. Though all Ferns may be grown in baskets, I name a few of creeping habits which are specially adapted for such a mode of culture. *Adiantum cuneatum*, *A. concinnum*, *A. farleyense*, *Asplenium flaccidum*, *Cyrtomium falcatum*, *Davallia canariensis*, *D. Novæ-Zelandiæ*, *D. tenuifolia*, *Goniophlebium appendiculatum*, *G.*

sepultum, *Hypolepis repens*, *Lygodium scandens*, *Microlepia platyphylla*, *Nephrolepis davallioides furcans*, *N. exaltata*, *Polypodium aureum*, *Platynerium alaicorne*, *Pteris scaberula*, *Woodwardia radicans cristata*.

PLANTS FOR FURNISHING WALLS.—All the *Abutilons*, if cut back occasionally, will do against a wall, and will flower well in such a position. Some of the *Acacias*, such as *grandis* and *juniperina*, are capital subjects. *Camellias*, *Oranges*, and *Myrtles* are unsurpassed for effectiveness. *Cassia corymbosa*, *Clianthus puniceus*, *Cytisus Everestianus*, *Fuchsias*, and *Pelargoniums* of all kinds will successfully cover a wall of any height. *Habrothamnus elegans*, *Hibbertia dentata*, *Jasminum de Poiteau*, *Linum trigynum*, *Lonicera fragrans*, *Luculia gratissima*, *Magnolia fuscata*, *Plumbago capensis*, *Rhodochiton volubile*, *Rhynchospermum jasminoides*, *Sollya linearis*, and *Heliotropes*.

The Greenhouse.—There are many forms of this structure all more or less useful.

“Who loves a garden
Loves a greenhouse too,”

says Cowper, and no garden is complete without a bit of glass ; even the humblest may find the means to obtain it if they like, for glass is cheap enough now. Before a person can tell what kind of greenhouse he wants, he must make up his mind what he wishes to grow in it. The specialist generally obtains more satisfaction from his work than the person who aims at accomplishing everything. There are certain classes of plants which do best alone, so that the conditions they require may be obtained. The *Pelargonium*, for instance, requires a very light house, with some constant warmth in winter ; whilst the *Cineraria* and *Calceolaria* can hardly be kept too cool, if the frost is kept out. Again, the *Pelargonium* must stand on a dry stage ; but the *Cineraria* likes a cool damp position. The same peculiarities run through the whole of the families of cultivated plants, and to attempt to grow them altogether under like conditions can only be done by each sacrificing something—that is to say, by a compromise. The perfection of plant-growing can only be obtained where each family has a house or houses to themselves, though by dint of much care and skill a fair amount of success is obtained with mixed collections in some gardens.

In the series of short chapters which will follow this I propose to group the families according to the treatment required. The two most important items in plant culture, especially in the case of those from temperate climes, are light and ventilation, and these

conditions are best secured in a span-roofed house. In hundreds of cases very good specimens have been turned out of old-fashioned lean-to houses,—this I know, for I have seen them ; but incessant care and patience were required to keep them from getting one-sided. With a span-roofed house built to suit the special families of plants cultivated, and made as light as possible—for most things, if the glass came down to the ground it would be an advantage, and the means of ventilation should be as extensive and as easily applied as possible. There is room, too, I think, for improvement in the arrangement of the stages or platforms on which the plants are placed. If the corners were rounded off there would be less friction, without loss of space, as the slice taken off the corner to get round at an easy curve would be added to the opposite side to fill up the angle there. I saw this carried out in a nursery at Liverpool where things were remarkably well done, and if it had involved any sacrifice it would not have been sanctioned ; but the square corners of stages in plant-houses cause useless friction, and often lead to broken pots and damaged plants. At the time the building is going on measures should be taken to obtain a good supply of water, for a great deal will be required in summer. A good roomy tank, built with bricks and lined with cement, will be very serviceable to catch all the water from the gutters on the roof, and it may be placed under the stage ; but in the summer this supply gives out, though I have often, by means of a large underground tank, stored enough water in winter to last the next summer from the overflow of the tank under the stage. Still this source sometimes gives out too, and, if possible, some other supply should be near, to become available if necessary. A pond is the best supply, and if at a higher level, a pipe leading from it and a tap in the tank will satisfy every want.

In suburban gardens the water will doubtless be laid on. I lay some stress upon this, because plants derive a good part of their nutriment from water. And hard water, given either at the roots or over the foliage, is one of the evils plant-growers have to guard against.

CHAPTER II

The Temperate House.—The temperate regions of the earth cover a large area, and the flora which inhabit these regions are varied and rich. The very large section known as New Holland plants will come under this category. The Cape sends its quota also, others are gathered up in China, and odds and ends are

brought from the Indian mountains and elsewhere. To refer to each genera separately would occupy much space and involve a good deal of repetition. Plants requiring the same temperature, the same soil, and the same general treatment, may for all practical purposes, in a work of this kind, be grouped under one heading. The plants from the temperate regions of Australia, New Zealand, the Cape of Good Hope, and China, comprise the most interesting and beautiful of our greenhouse plants. It is true their cultivation under ordinary circumstances involves more care and thought than the common ruck of soft-wooded plants with which they are too frequently mixed; hence they are less grown than they deserve to be. But there is no real difficulty in growing New Holland plants, if they can have a light airy house to themselves, and receive only enough artificial heat to keep out frost and dispel damp. The reason why so many people fail with the beautiful shrubs from Australia, which are so well adapted to impart beauty and character to our gardens in early spring, is because they mix them with the soft-wooded plants, and try to make them submit to the same rough and irregular treatment in the matter of watering, ventilation, etc., which soft-wooded plants usually get. Assuming, therefore, that a house can be devoted to the culture of this class of plants, there should be no difficulty in making it most interesting at all seasons of the year, but especially in winter and spring, when the largest number will be in flower. A span-roofed house is the most suitable, because light in abundance is essential to their well-doing. The ventilation should be as full and perfect as possible, and the water supply must be soft and pure. Having all these conditions, the man that cannot grow New Holland plants must be defective somewhere, either in intelligence or energy.

SOIL AND POTTING.—This class of plants will all grow freely in good peat, and, where rapid growth is required, peat made porous with sand may be used. But it frequently happens that rapid growth is not required. Where the houses are of moderate size, and the plants are not required to be run up very quick for exhibition or any other special purpose, it is better to bring them on slowly, to furnish well the base before encouraging an upward tendency. And these slowly grown plants—all other things being equal—are generally longer lived than those grown rapidly at first. Acting on the latter proposition, instead of potting altogether in peat, a proportion of loam should be added varying in quantity according to its character; indeed most of the New Holland plants have been well grown altogether in Wimbledon loam, and the more loam is used the better, if hardy, slow, well-built-up growth is required, always provided that the loam is of good quality and of soft silky

texture. Loam that feels harsh to the touch is deficient in humus or vegetable matter, and without some addition in the way of peat or leaf-mould is not adapted for plant-growing, especially hard-wooded plants, which for the most part have fine roots requiring a soil possessing some retentive power without being absolutely adhesive. Having selected the right kind of soil and added the necessary sand or crushed charcoal to give it the requisite porosity, the next question is the mode of using it. Specimen plants—that is, plants which are several years old and have reached a good size—should be potted early in summer, to ensure the new soil being occupied before the dark days come; but in all cases annual repotting may not be necessary, and if not required should not be done. All plants may be assisted during the blooming time with a little artificial stimulant, such as Standen's manure, or something of a like nature; this and a loamy compost will enable us to grow our plants to a good size in comparatively small pots, which will be an advantage to the small grower. Good peat is sometimes difficult to obtain, except by purchase. Loam, *i.e.* the turf from an old common or pasture, can be obtained in most places either for love or money. The Kentish and Surrey peats are good, and can generally be purchased either in small or large quantities. Peat is usually sent ready for use. Loam, on the other hand, for most plants should be laid up in a heap till the grass is killed; and if much potting has to be done, a fresh supply proportionate to the demand should be secured every year, so as to have it in the best possible condition for the plants.

The Potting House.—In all gardens there should be a place set apart for storing potting materials, as well as a house or shed for performing the potting operation in; and such shed should be light, roomy, and conveniently situated for the work. Where the collections of plants are large, and much potting has to be done at various seasons, a couple of hot-water pipes should be run through the shed to make it comfortable for tender plants. Very many good gardens are only indifferently provided with conveniences for this work. All pots and drainage materials must be clean. No man will use a dirty pot who is not careless about success. There are usually broken pots enough in most places to furnish drainage for all the pots used in potting. These should be broken up into different sizes in bad weather, passed through sieves, and packed away ready for use when the busy time comes round. All soil for potting should be broken up with the spade or the hands. The latter plan is best for valuable specimens. It may be prejudice, perhaps, but I think the plants thrive better in soil that has been passed through the hands in its preparation. One reason

may be the use of the spade, the rougher treatment dislodging a good deal of the fine soil from the fibre—the two are not so well blended as when the soil (be it peat or loam) is pulled into fragments with the hands just previous to using it. The soil should be prepared specially for the size of plants and the pots they are intended to fill. For small pots it should be broken up fine; for large plants it may be rougher, containing all the fibre as taken from the pasture or common; but it should not be sifted except for cuttings or plants just rooted, which it is intended to transfer from the cutting pots to others of the smallest size. The size of pot used in what by gardeners is termed the shift must vary according to the health and condition of the plant. If the plant be small, a pot 1 inch larger in diameter will be enough. Large plants may have larger proportionate shifts, but it is not often that a larger shift than 2 inches will be required. The drainage of the pots should be proportioned in depth to the size of pot employed. In the case of small pots, or say pots 6 inches in diameter, 1 inch in depth will be ample; but in 10-inch or 12-inch pots 2 inches will not be too much. I have never found much advantage to follow the use of an inordinate amount of drainage. It reduces the earth-holding capacity of the pot, and renders the plant more liable to suffer from drought. But the drainage should be properly placed. One large piece should cover the hole in the bottom, so arranged that the water can get away and out at the hole freely. Most of the best-made pots for specimen plants have holes pierced through the sides of the pot, close down to the bottom, in addition to the one in the centre, and these too should be covered with large pieces of crock. Then a layer of good-sized pieces should be laid all over the bottom; on these should be placed a layer of smaller fragments, and on the top a thin layer of still smaller bits. A pot so drained cannot become water-logged. On the drainage should be placed a little Moss, to keep the finer particles of soil from being carried down by the water. Sometimes a few rough fragments of turfy soil is used instead of the Moss, and this latter plan answers quite as well. I have gone rather fully into this matter, because, in the case of hard-wooded plants, it is very important. The soil should be used in a medium state, neither wet nor dry, but in a nice healthy crumbling condition. Neither should the balls of the plants that are to be operated on be in an extreme state of dryness or wetness. If a plant requires water, it should stand for several hours, to allow all surplus water to drain away before potting. It is better to give two shifts a year to a fast-growing young specimen than to run any risk of overpotting. In potting on healthy

specimens the ball should be transferred from the old pot to the new one entire, without any disarrangement beyond removing the old drainage from the bottom. In adjusting the ball in the new position the soil placed over the drainage beneath the ball must be made firm, and there should be space enough left between the top of the ball and the rim of the pot to hold water, otherwise there may be a difficulty in keeping the plants well supplied, and the space thus left should be graduated according to the size of the pot. The collar of the plant should be elevated a little above the surrounding parts to prevent the possibility at any time of soil accumulating round the stem, either by the action of water or other means, as hard-wooded plants are very impatient of this immersion of stem, death being often caused by it. The ball should be held steadily in the centre of the pot with one hand, whilst the other is used to distribute the soil equally round the chasm to be filled, using the potting stick frequently as the work proceeds to make all firm. Firm potting in the case of fine-rooted plants is absolutely necessary. A little sprinkling of silver sand on the top when all is finished may be given. It will sink in with the water and be beneficial in various ways.

RESTORING UNHEALTHY PLANTS.—Nothing in this world has more than a limited duration, and plants, like men, must die in the course of Nature; but there are times of sickness and failing health which need not necessarily lead to death if the right means are employed to bring back the plant to health. If the plant showing signs of failing health be an old one, it will be better to throw it out, for it is well-nigh impossible to restore an old, sickly, hard-wooded plant. But occasionally young plants, or plants with a good deal of useful work in them, will become sickly and lose colour from some temporary local and easily-removed cause, it may be. The first thing is to find out the cause, and the plant doctor, like the physician of bodily ills, will be successful in proportion to his diagnostic skill. Nine-tenths of the ailments plants suffer from arise from injudicious watering. It is true that with careful drainage, so that the water can pass freely away, the opportunities for making mistakes are not so numerous; still, something or other will occur, as the unexpected frequently happens. A worm, perhaps, finds an unguarded opening, into which he crawls; other worms may perhaps follow, but the first will require no assistance to upset the circulation of the plant by stopping up the drainage, which causes the soil to become sodden and sour. The moment a plant loses colour, the condition of the roots should be seen to, and, if necessary, the choked drainage replaced with clean material. At the same time, the worm must be dislodged

and captured. A rap of the pot on the edge of the potting bench will very often bring the worm to the surface. If that does not suffice, turn the plant out and run a piece of wire (a knitting needle will do) up through the ball in one or two places. This invariably brings them out, and if carefully done no harm will follow. New Holland plants are not often subjected to insects. Occasionally a brown and less frequently a small white scale attacks the bark of the stems, to which the latter clings with great tenacity. The brown scale can easily be got rid of by washing with a sponge, using a strong solution of soft soap or Gishurst compound; but the small white scale is more difficult to eradicate, and strong solutions of soap or Gishurst are necessary to dislodge it. If a plant should at any time become badly affected, it is better to destroy it, and start afresh with a young clean plant, than incur the labour and trouble necessary for its disinfection. Water heated to 120°, with soap in solution, syringed over a badly-affected plant, will clear off large numbers of the clinging pest, but no rest must be taken so long as a scale remains; and unless one is endowed with a great amount of energy and patience, it is better to stamp the insect out at once and begin anew.

There are other insect pests to deal with, such as aphides and red spider; the former is usually most troublesome just as the young growth breaks out in spring, and a few fumigations with Tobacco will, if taken in time, keep the plants clean. The red spider, as a rule, only comes with the heat of summer, and may be set at defiance if one has a good syringe and uses it freely, with soft rain water only. In the

SUMMER MANAGEMENT OF NEW HOLLAND PLANTS when the growth has been completed under glass, which will generally be done by the beginning of July, a sheltered position in the open air should be prepared for the plants by laying down a couple of inches of coal ashes for them to stand on to keep the worms out of the pots. They may be arranged in beds for convenience of access, as very careful watering will be necessary, and each plant must be within reach of the hand which wields the waterpot. Indeed

WATERING is the most important operation in connection with plant culture in pots. As each plant, as a rule, requires looking at daily, there are 365 opportunities for making mistakes every year. Small cause should there be for wonder, therefore, if a plant occasionally gets a drop too much, or is stinted, as the case may be, in trying to avoid an over-liberal hand. Whenever a plant requires water, enough should be given to moisten the whole body of soil. This rule holds good, no matter what the season of the

year may be—whether winter or summer. Hard-wooded plants must never be allowed to become dust dry, for many of them have fine hairlike roots, which perish if permitted to become thoroughly dry. Indeed the root structure of a plant will furnish us with a good hint, if we take it, as to its needs in both food and drink. Though there is no certain guide to indicate when a plant requires water, there are several circumstances which, if small in themselves, are, when taken together, sufficiently reliable. The same person should of course always do the watering. Chopping and changing about will lead to mischief. When one and the same person waters any given lot of plants regularly, he will remember when such and such a plant was watered last; he will also know when and how they are potted, and the present condition of their roots—very necessary knowledge to possess. He will also have an eye to the weather, as in bright or drying windy weather plants dry much faster than when that of an opposite character prevails. Rapping the side of the pot smartly with the knuckles is usually a reliable test in the case of large specimens, as when the ball is dry a hollow sound is given out, and when wet the sound is dull and heavy; small specimens may be lifted in the hand, and the weight is a sure test as to the condition of the ball. In the course of a short time, by taking pains, by observing and noting all the surrounding circumstances, experience will be gained which is of great value in the management not only of hard-wooded, but of all plants. The danger arises from falling into a careless habit of acting first and thinking afterwards—of giving water before we are quite sure as to its necessity. Much more harm is done by giving too much water than too little, though I have met with cases where giving too little water at a time has been injurious. Instead of giving enough water to soak all the ball, only a little was poured on the top, which failed to moisten the soil beyond 2 or 3 inches deep. Repeated doses on the top in this way will soon do serious harm, as the roots at the top of the ball are suffering from repletion, whilst the bottom of the ball is as dry as dust, and consequently neither set of roots are able to perform their functions properly, and the plant dies. In the case of hard-wooded plants death soon ensues. I have mentioned this circumstance to show how errors may arise, and what fatal consequences sometimes spring from what appears a very small matter indeed.

NEW HOLLAND PLANTS IN THE BORDER.—Those who have visited the large temperate house at Kew will have seen how well for the most part these plants thrive planted out in the borders of a large house; and in many a conservatory in the country, long

before the present temperate house of Kew was built, it could have been demonstrated how well adapted many of them were for forming permanent features under glass, and how simple and easy their management was. A well-drained border, 2 feet or so deep, formed of healthy soil—a little pruning after flowering is over, just to keep the outline right and maintain symmetry—a good supply of water and an occasional wash with the syringe or engine in summer—are all that is needed. The time will come when this class of plants will be more sought after, to the great advantage of both plant-growers and proprietors of gardens; but to revert again to their culture in pots, which will always be the most popular system, as the two or three months they pass in the open air ripens the wood and induces a free-flowering habit, I shall just say a few words about

TRAINING, ETC.—All plants are improved by more or less pinching and pruning, which is usually done in the case of flowering specimens immediately after the blossoms fade. The plants are then pruned back as much as is necessary to put them into shape and maintain the proper balance of strength. Without a little trimming many plants will become loose and straggling in habit, and wear out at the base. Young plants should receive attention from the first by having the points of the strong shoots nipped, to induce a bushy habit. Of course the work needs discrimination, as most of the plants under consideration flower on the young wood, and, except in the case of young plants in the course of formation, the pinching should not be continued far into the growing season. As regards training with stakes and ties, any plant capable of supporting itself in an erect position does not require staking. If it has a loose rambling habit, the finger and thumb applied when the shoots are young will correct it, strengthen the base, and often give an unlikely-looking subject a graceful flowing outline. To stake a plant and make it look well with the least possible number of supports, and these not too conspicuously placed, is like making a bouquet—it requires a trained eye and skilful fingers. Some people are born with that faculty, whilst others never seem to acquire it; hence the reason why so many ungainly looking specimens are met with. The addition of a few slender stakes, if rightly placed, will often improve a plant considerably. Passing a collection of plants through the hands of a good plantsman is like putting a batch of raw recruits through the hands of a smart drill-sergeant—it sets them up and pulls them together, so to speak. Of course I do not say that for home use both the plants and the men might not be as well without so much setting up, but they would not pass muster in public. And whoever aspires to take a leading

position at the exhibitions must learn to train plants neatly without using too many sticks, as the latter possess no beauty in themselves, and are only tolerated because of the evident necessity. Small neat sticks, painted green, look the best, and can be made in bad weather. Double laths—that is, deal laths of a double thickness which will easily rend—are the most suitable. Any one at all handy with a sharp knife will quickly make a large number, and a coat of green paint makes them appear less conspicuous as well as more lasting. But as it must be a disadvantage to the plant to have the ball pierced and perhaps the roots injured by having sticks thrust in in all directions, as few as possible should be used, and those not inserted more deeply into the ball than is necessary to obtain the requisite hold of the soil. Most of the plants will require attention annually, but a good deal of this work should be done in winter when other work is not pressing.

CHAPTER III

List of Plants for Temperate House.—Roof climbers should be used sparingly for this house, as full light is so essential for this class of plants. Still, if there is space and convenience, there are neat-habited climbing plants that will not shade injuriously, and will furnish and improve any bare space on roof or wall. The following short list are among the most useful:—*Acacia Riceana*, *Brachysema acuminata*, *Hibbertia dentata*, *Jasminum de Poiteau*, *Kennedyia lilacina*, *K. monophylla*, *Lapageria rosea*, *L. alba*, *Sollya heterophylla*, *Swainsonia Osborni*. I also add a selection of New Holland and other temperate house plants that will thrive under similar conditions and do well together:—*Abutilon Boule de Neige* and others, *Acacia armata*, *A. diffusa*, *A. Drummondii*, *A. grandis*, *A. longifolia magnifica*, *A. platyptera*, *A. verticillata*. The *Acacias* are a most interesting and beautiful class of Australian shrubs of elegant habit of growth and easy culture. *Platyptera* flowers at Christmas; the remainder follow in succession through the spring. Everybody with a greenhouse should grow some of these, as they will bear the usual treatment given to a mixed collection very well. *Acrophyllum venustum*, *Adenandra fragrans*, *Aphelexis macrantha purpurea*, *A. prolifera Barnesi*, *A. rupestris grandiflora*, a beautiful genus with everlasting flowers, formerly much grown as exhibition plants for the spring and summer shows; *Boronia Drummondii*, *B. serrulata*, *B. megastigma* (the last is sweet-scented), *Chironia glutinosa*, *Cassia corymbosa*, *Chorozema cordata splendens*, *C. varium nanum*, *Coleonema rubra*, *Coprosma Baueriana*

variegata, *Coronilla glauca*, *C. g. variegata*, *Correa* Brilliant, *C. cardinalis*, *C. speciosa major*, *Crowea latifolia*, *C. saligna major*, *Cytisus Everestianus*, *C. filipes*, *C. racemosa elegans*, *Daphne indica alba*, *D. elegantissima*, *Hedera tulipifera*, *H. fuchsoides*, *Dillwynia splendens*, *Diosma capitata*, *D. gracilis*, *Eriostemon buxifolius*, *E. intermedius*, *E. cuspidatus ruber*, *E. pulchellus* (very handsome shrubs of pyramidal outline, bearing innumerable star-shaped flowers in winter and early spring, easily cultivated), *Eutaxia floribunda*, *Gastrolobium Drummondii*, *Gnidia pinifolia*, *Grevillea elegans*, *G. robusta* (the two last named are handsome decorative plants with Fern-like foliage), *Habrothamnus elegans*, *H. fascicularis* (the last-named plant is invaluable for winter blooming, succeeds well in pots, or planted out and trained as a standard with the flowering shoots drooping over has a pretty effect), *Hibbertia dentata*, *H. Reidi*, *Hovea Celsi*, *Hoya carnosa*, *Hydrangea Thomas Hogg*, *H. Paniculata grandiflora* (the *Hydrangeas* are capable of great things as decorative plants when well done), *Jasminum grandiflorum* and others, *Kennedya Marryatiae* and others, a very handsome race of twining plants; *Lasiandra macrantha floribunda*, *Leschenaultia Baxteri major*, *L. biloba major*, *L. intermedia* (grand plants when well grown, sandy peat, well-drained pots, must be watered with judgment, and have a light position near the glass in winter), *Linum tigrinum*, *Luculia gratissima* (very fragrant, large rose-coloured flowers, in winter does best planted in a good border, excellent wall plant), *Metrosideros floribundus* (Bottle-brush Myrtle), *Mitraria coccinea*, *Myrtles* (various), *Neriums* (*Oleanders*—various, beautiful flowering plants of very easy culture), *Pimelea decussata*, *P. Hendersoni*, *P. Neippergiana*, *P. spectabilis rosea*, very beautiful early summer flowering plants, grand for exhibition when well done, not difficult to grow; *Plumbago capensis*, fine for planting against a wall; *Polygala Dalmaisiana*, *P. cordifolia*, *Pultenæa Drummondii*, *Roella ciliata*, very pretty plant, peat and sand, using plenty of the latter to ensure porosity; the peat should be fibry and rammed in firm, drainage must be perfect; do not over-pot, and water with care and judgment; must have a light position; *Sparmannia africana*, *Styphelia tubiflora*, *Swainsonia Galegeifolia alba*, *Tremandra ericæfolia*, *T. verticillata*, *Witsenia corymbosa*. The class of plants under consideration are best grown in a light, not too lofty, span-roofed house, all the better for the plants if the glass comes down almost to the ground. At the same time they will do fairly well, as may be seen at Kew and many other places about the country, in lofty houses. In such houses occasionally a few of the Australian Palms, or *Dracænas*, may be introduced to give character and

breadth to the scene. The night temperature need not exceed from 40° to 45° , and in frosty weather with fire it may drop to 38° without doing any harm. The plants will be healthier and more robust under comparatively cool treatment.

The Heath House.—A good many years ago I knew an amateur whose hobby was the culture of Heaths. He had mounds of hardy Heaths in his back garden, and beds and borders of bright pink Heather adorned his front one. Into his greenhouse no other plant was admitted. He had a low pit full of young plants that had been propagated with his own hands, and which, in course of time, would be promoted to the greenhouse stage. Heaths adorned his sitting-room window, and I verily believe he had Ericas on the brain. At any rate, Heaths in many varieties formed his hobby and had become a part of his existence; and, let me ask, where can a better, brighter, or cheaper hobby be found? If the conditions which Heaths require are present, there is no difficulty in their culture, and these requirements are exceedingly simple—pure air, free from damp and stagnation, peaty soil freely intermixed with sand to keep it porous. In the case of the hard-wooded kinds, bits of sandstone intermixed are valuable for keeping the soil in an equable state as to moisture; free drainage, so that no stagnant moisture can remain near the roots, and firm potting in all stages of their growth, which for the most part should be done early in the season, are details it will be well to remember. If a plant is potted in autumn, it should only be on the principle of choosing the least of two evils, and when a pot-bound plant might suffer if left till spring. Just enough artificial heat to keep out frost and expel stagnant damp and no more; a thin shade over those plants in blossom during bright weather; a light house, with the stages not too far from the glass; pure soft water, enough being given to moisten each plant thoroughly when it is required, and then leaving them without till the ball is becoming dry again—are items which should not be lost sight of. In winter no more water should be spilled on the paths or stages than can be helped, but at the same time each plant should have enough water given, when it is necessary to water at all, to run out at the bottom. These constitute the chief of the requirements of the Erica family, and scarcely anything can have simpler or quieter wants, for the labour needed is a mere nothing. The reason why so many people fail to grow Heaths well is, that they keep them in stuffy houses mixed up with a lot of soft-wooded rubbish. For the most part, gardeners are heavily handicapped in the culture of this class of plants. At times every bit of blossom has to be taken to the conservatory, and the Ericas must yield to the same conditions as

the denizens of the stove and other plants, and so the Heaths, in course of time, dwindle and die.

There is no class of plants capable of inspiring so much interest as the one under consideration. If they are given a nice light house, and permitted to remain in it, carrying out the rules of treatment I have laid down above, with a good collection some will always be in flower; and though they can only be used sparingly as cut flowers, yet they will furnish very choice button-hole bouquets all the year round with little sprays of Maiden-hair Fern for greenery, and the latter may be grown under the stages so as to be always available. All through the summer, and as far into the autumn as possible, night ventilation must be given, avoiding cold draughts or chills. A damp stagnant atmosphere will generate mildew, which is about the only disease Heaths are subject to; and all through the dark dull days a watch must be kept for the appearance of the pest, and the moment discoloration of the bright green foliage appears, apply the usual remedy—sulphur—and follow it up till the mildew is destroyed. Mildew, when left to work its will upon a plant, quickly destroys the foliage, and, in the case of Heaths, death rapidly ensues.

PRUNING AND TRAINING.—The hard-wooded slow-growing kinds require but little pruning; indeed the tricolours and a few others had better not be touched at all with the knife, but the soft kinds should be cut back regularly after blooming to keep them well furnished. As regards training, a certain amount of staking is necessary after the plants get large to keep them in proper order. The soft-wooded kinds, such as *hyemalis*, *Willmoreana*, etc., do not require staking; in fact they look better without it. Secure a good healthy bottom by stopping the plants freely when young, and the growth they make afterwards in spring will flower in winter and be sturdy and strong enough to be self-supporting. The habit of growth of all the *Ericas* is so neat, and there is so much variety in the shade and tints of their foliage, that the plants even when not in flower are ornamental. The dead flowers must be picked off as soon as they fade, unless we wish to save seeds from any particular variety; and there is an opportunity for any persevering cultivator to hand his name down to posterity, as others have done before him; for a really good seedling Heath will have something more than the ephemeral duration which is attached to the majority of new things annually introduced. After the plants have been cut back, which should be done as soon as the flowering is over, those so operated upon should be placed at one end of the house and kept a little closer till the young growth breaks away, when, if repotting is necessary, it should be done. If

well grown, specimen Heaths have a considerable value in a commercial sense, and when they get too large they may be disposed of to make room for the young specimens coming on; it is always best to have a relay of young plants coming on in succession, because even under the best management plants will get old and die. These young plants in summer will do well in a cold frame or pit, but in winter they will do better and be safer in the house on shelves near the glass. In the summer management many of the best cultivators prefer keeping their specimen plants altogether under the shelter of glass, as then heavy rains or winds cannot injure them; but overcrowding in the house must be avoided. It is better to grow only a few plants, and grow them well, than have a large collection and spoil them by overcrowding; and no class suffers so soon from this as Heaths do, simply because fresh air is an absolute necessity, and there cannot be an efficient circulation when plants are crowded together. If a part of the stock of Heaths must be turned out in summer, put out the soft-wooded kinds, such as *hyemalis*, *Willmoreana*, *Cavendishi*, etc. These kinds are rather benefited by open-air treatment from the middle of July to the middle of September. Always, in potting Heaths, keep the collar of the plants well up; there is less danger of over-watering when the centre of the ball is elevated from half an inch to an inch above the circumference near the edge of the pot, or a little more in the case of large specimens.

THE EPACRIS.—This may be associated with the Heath, having some resemblance to it in character and growth, though as regards the latter the *Epacris* is less dense and more erect in habit. It is very valuable for winter flowering, and there are now many beautiful varieties, including the garden hybrids, embracing all shades of colour between pure white and bright crimson. The long shoots, if well ripened, flower nearly their whole length, and are very effective as cut flowers, or the plants themselves may for a short time be moved into any position where particular effects are sought to be improvised. In this respect they are much more manageable than Heaths. But though this is the case, no more risk should be run than is necessary. If specimen *Epacris* are moved to the conservatory, they should occupy a light position, be carefully watered, and not remain there too long. When the flowers fade, the young shoots should be cut back to within a few inches of the base from whence they spring. Just after the pruning a little higher temperature will be an advantage to induce the new growths to come up strongly. This higher temperature may be secured by keeping the plants that require it altogether at one end of the house, with that end closed. Where

there is a vinery or Peach-house, such plants as Epacris, that are not much subject to insects, may be placed in its genial warmth. It is a great help to increase the temperature a few degrees, and to use the syringe freely when young shoots are pushing up. It gives them a better start, and leads on to the production of more and better-blooming wood. But they must not remain in the vinery or Peach-house too long, or the shoots may become weakly and drawn. Repotting, if it is necessary, may be done when the young shoots have fairly started, but the Epacris, like the Erica, does not require shifting into a larger pot till the pot it already occupies is full of roots. Firm potting is essential, and sandy peat is the best soil; but I have seen it grow well in loam and leaf-mould with a liberal admixture of sand.

PROPAGATING HEATHS.—There are two ways of increasing our stock of Heaths. First, there is the natural plan of saving seeds, and secondly there is the propagator's method of raising them from cuttings, which is the best, indeed the only, plan of perpetuating established kinds.

From Seeds.—As regards raising them from seeds, it is not much practised except by enthusiastic growers who are not content to follow always in the track of other men. The seed pods should be gathered as they show signs of ripening, placed in a saucer or saucers if we are saving more than one variety at the same time, and kept in a cool airy room. As soon as the pods are ripe and dry, rub them out and put up the seeds in packets till March, that being the best month to sow in, because the seeds are a long time in vegetating, sometimes remaining in the ground six months; and by sowing early there may be a chance of getting them all up and established before the dark days are upon us. Sow in 6-inch pots, filling them half full of drainage; fill in the remaining space to within half an inch of the top of the pot with peat and sand in about equal portions. Make all firm, sow the seeds, and cover with a light sprinkle of sand. Heath seeds are very fine, and if covered beyond the merest sprinkle they may perish rather than grow. As soon as the seeds are all sown, water them with a fine-rosed pot, and place them in a close frame without any artificial heat. Keep the seeds moist, and cover the frame with mats in frosty weather during spring. Shade from bright sunshine, and give air as soon as the seeds vegetate—only a little at first, to be increased afterwards. Pot off the young plants when large enough to handle, placing several of them in a pot—round the edges chiefly—the compost to be the same as for the seed pots, using small pots. Many of the hard-wooded kinds are difficult to root from cuttings, and the work of raising seedlings has an interest of its own, especi-

ally to the amateur with plenty of time on his hands. Raising seedling Heaths may be hastened if a little artificial heat is employed in the earlier stages, but it involves some risk, and the young plants are not so hardy and strong as when kept in the cool frame.

From Cuttings.—Fill as many 8-inch pots as are required two-thirds full of drainage, with a layer of Moss on the top to keep the drainage material clear. On this place peat and sand in equal proportions, leaving about an inch on top for sand. When all is made firm, water with a fine-rosed pot, mark the position of the bell-glasses on the surface of the sand, and dibble in the cuttings just within the mark. An 8-inch pot will hold a good many cuttings—several sorts will probably go in one pot; and in selecting the cuttings it may be as well to pick out those which resemble each other in character, so that all may be rooted about the same time. There is no advantage in having large cuttings; they need not exceed half an inch to 1 inch in length, and should neither be too hard nor too soft. If just getting a little firm at the base, they will be suitable. The leaves should be stripped from the lower half of the stem, and the base be cut smooth with a sharp knife. Heaths may be propagated at almost any season when suitable cuttings can be obtained. If done in summer, and the plants from which the cuttings are taken have been exposed to the air, place the cuttings in a cold frame, keep close, and shade when the sun shines on them, wiping the bell-glasses every morning. No other plants should be in the frames. If the cuttings are taken in spring, or when the plants are under glass, they should have a very little warmth, with the same attention in shading and wiping glasses once a day as in the former cases. Cuttings of delicate plants are often lost by using impure sand; and it is a good plan to wash the sand for this purpose. As soon as the cuttings are rooted and hardened sufficiently by ventilation, they should be potted into small pots—four or five round the sides of a 3-inch pot—and replaced in the frame.

VARIETIES OF HEATH.—I append a selection of useful Heaths and Epacris which will give a succession of blossoms throughout the season :—

Soft-wooded Heaths.—Bowiana, caffra nana, Cavendishi, colorans, c. nana, depressa, elegans, eximia, gracilis vernalis, g. autumnalis, hyemalis, propendens, tubiflora, ventricosa alba, v. magnifica, v. Bothwelliana, v. coccinea minor, v. rosea, vestita alba, v. coccinea, v. rosea, Willmoreana, superba.

Hard-wooded Heaths.—Aitoniana, ampullacea major, Archeriana, aristata, cerinthoides, Devoniana, Eweriana superba, gemmifera

elegans, *Hartnelli superba*, *hybrida*, *inflata alba*, *Irbyana*, *jasminiflora alba*, *Lambertiana rosea*, *maidstoniensis*, *mammosa major*, *Marnockiana*, *melanthera*, *mirabilis*, *odorata*, *Parmentieri rosea*, *perspicua erecta*, *reflexa*, *retorta major*, *Savileana major*, *Sindryana rubra*, *tortiliæflora*, *tricolor coronata*, *t. elegans*, *t. exquisita*, *t. flammea*, *t. impressa*, *t. superba*, *t. rosea*, *t. Wilsoni superba*, *trumphans*, *vernix coccinea*, *princeps coccinea major*.

Epacris.—*Ardentissima*, *delicata*, *Eclipse*, *densiflora*, *grandiflora rubra*, *hyacinthiflora candidissima*, *impressa*, *impressa alba*, *miniata splendens*, *pulchella major*, *The Bride*, *tricolor*, *Vesuvius*, *magnifica*, *splendida*, *Lady Alice Peel*.

PROPAGATING NEW HOLLAND AND OTHER HARD-WOODED PLANTS.—The large seedhouses keep seeds of many of the above, which, if sown in spring in a gentle warmth, will make nice little plants in the same season. They may also, with a very few exceptions, be increased by cuttings, using the same precautions as for Heaths. *Eriostemons* and *Correas* are difficult to strike, and are usually grafted on suitable stocks. In the case of *Eriostemons* I have succeeded very well with one of the free-growing *Pimeleas* as a stock, such as *P. decussata*. The better kinds of *Correas* take well on a free-growing species of their own family, *Correa alba* being generally employed.

Grafting is a very simple process, and seldom fails if the necessary conditions are present. If it is done in summer, a close frame or pit will suffice, shading when the sun shines. At other seasons a little warmth will be necessary, keeping close and shading till the union is effected, which will be in about a month or six weeks. Constant watchfulness is necessary in propagating, as there are many little details in the work that cannot be set down here. In the case of the plants referred to, the grafting is done when the stocks are about as thick as a large-sized quill, the graft, a young healthy shoot just getting firm at the bottom, being fixed on the side of the stem 2 or 3 inches from the ground. The process of attachment is as follows: A thin slice of bark and wood is cut away from the stem of the stock by a downward cut about 2 inches long. When the knife, which must be as sharp as a razor, has descended far enough, maintaining a regular even course all through, it is withdrawn, and its keen edge is applied outside at the bottom of the cut slip of bark and wood in a slanting direction, until it is severed and becomes detached, leaving a little niche, into which the bottom of the scion, when prepared, will fit. The graft is prepared by cutting a thin slice from its side to make it fit the cut position on the side of the stock; when the fit is perfect bind the two together

firmly with something soft—worsted or cotton yarn will do. The head of the stock should be reduced to check the flow of sap, but the stock should not be headed down till the graft has taken and is prepared to assume the leadership. To the experienced propagator, surrounded by the necessary materials and conditions, the increase of hard-wooded plants presents no difficulties—it is usually made a mere matter of certainty. But those who have had no experience, and have not the patience to master minutiae in other matters, will find it better to buy their young stock instead of propagating it. Still, as I know many gardeners and amateurs do propagate such things, or have at least a wish to do so, I thought a brief outline would not be out of place.

CHAPTER IV

The Orangery.—The culture of oranges, in its old-fashioned sense for ornament merely, seems of late years to have become unfashionable. This has led to their neglect, and newer favourites have usurped their places. I know many old gardens, now Orangeless, if I may use such a term, in which, thirty years ago, the Orange trees used to be a special feature. I do not know that this is a subject for regret, but somehow one misses their delightful perfume, as one specimen or another was nearly always in flower, accompanied at the same time by both green and golden fruit. It is true the fruits were not, as a rule, usable, except for flavouring purposes; but the golden fruit, clustering thickly amid bright green handsome foliage, had a value in winter for decorating the hall or the ballroom; and a few of these old plants, which I remember so well, laden with fruit to mix with the Palms and other greenery, would brighten up the scene immensely. Some of the small-leaved kinds trained as standards are very effective, and may be grown in small pots for table or room decoration. In the summer large Orange trees are striking objects for the formal garden, placed at intervals on the terrace, or in prominent situations anywhere. The old-fashioned Orangery was a dark dreary place, often having an opaque roof, and only sufficiently heated to keep out frost. It was simply a sheltering place for the trees in winter, the summer being passed in the open air. Of course all the Orangeries were not of this character. In some places Oranges were well done, and there is no question that good Oranges could be grown in England if it were worth while to do so, but the trees must have a higher temperature than that merely required to produce fruit and flowers for ornamental purposes. In the former case,

they must be grown systematically under suitable conditions, and with a gradually increasing temperature as the fruit progresses. But Oranges are imported so cheaply that it is hardly necessary, except it may be in the most complete establishments, to grow them for the fruit alone. But I think that, for decorative purposes, Orange trees might have more attention given to them, and nearly all they require is to provide a light place, where the frost is kept out, to shelter them in winter. All through the summer the Orange trees may stand in the open air on the terrace, or in any position where furniture of a somewhat novel character is appreciated. There is hardly a place of any size that a few Orange trees planted about would not improve. I have seen the pots plunged in a sheltered nook on the lawn with good effect.

SOIL AND POTTING.—Turfy loam is the best soil, slightly enriched with well-decayed manure; crushed bones are also good for them in moderation. I have used bones mixed with the soil at the rate of a peck to a barrowful of soil, both for potting and top-dressing, with manifest advantage, and this will permit of small-sized pots being used for comparatively large plants. Large plants, if the drainage is clear, may go several years without repotting. They require a good supply of water in summer, but less will be needed in winter, although the temperature of the building in which they are placed will have some influence.

The whole Citron family are excellent for covering walls anywhere under glass. I have seen good crops of Lemons grown on the back of a viney, and a wall covered with Oranges or Lemons, in fruit or flower, has a delightful and quite novel appearance. They succeed with but little trouble when planted out in a good bed of loam under glass, where a night temperature of from 40° to 50° can be maintained in winter.

INSECTS AND DISEASES.—Orange trees are rather subject to the attacks of brown scale. The best preventive is plenty of clean water syringed over the foliage, occasionally putting a dash of soft soap in it. If neglected, and they get badly infested, there is nothing for it but a long period of sponging with an insecticide, such as soft soap or Gishurst compound.

TREATING UNHEALTHY PLANTS.—When an Orange tree becomes sickly, it will be most probably found, on investigation, that the drainage has become choked, so that the water cannot pass freely away. Turn the plant out of the pot, if in a bad state, and remove the choked drainage and as much of the exhausted sodden soil as can be got away without injuring the roots, and repot in a clean pot of the same size. Though not easily killed, yet it is possible to have them in very bad condition, and sometimes it may

be an advantage to give the plants a little bottom-heat in order to induce an early root action. I remember once having a lot of very unhealthy Orange trees placed in my charge to recover their health. They were too large for any house we had possessing a bottom-heat pit, but we improvised a bed of leaves in a large vinery where the Vines were just breaking, and after pruning both the branches and the roots we potted them into as small pots as they could be got into, and plunged them in the bed of leaves, which supplied a nice steady warmth. The roots commenced work almost immediately, and after a time latent buds burst out of the naked stems, and during the summer the plants were brought into a healthy vigorous condition again.

PROPAGATING ORANGE TREES.—The pips or seeds of the imported Oranges may be saved and planted in spring. They soon germinate if treated to a little bottom-heat, when they should be potted singly into small pots, and if grown on quickly in heat they will be fit for grafting in twelve months. The mode of grafting young plants has been referred to already in the case of Correas and Eriostemons. If a close pit or frame can be had in spring with a temperature of 60°, grafting Oranges is a very simple, easy business; but without this it is better not to attempt it. Oranges may be budded later in the season if the grafts or any of them fail, which is not likely if all things are right.

VARIETIES.—The Tangarine, the Maltese Blood, and the Sweet China are the best kinds to grow for dessert; the Seville and its varieties, with the Otaheite and the Myrtle-leaved, are among the best for merely ornamental purposes. The Lemon, Lime, and Shaddock should also be included.

The Camellia House.—In warm sheltered places on the south and west coasts of England, many fine old Camellias are met with in the open air, and in favourable seasons they flower abundantly. Two remarkable specimens of noble tree-like aspect I saw some years ago growing in the grounds of Powderham Castle, on the banks of the Exe, a few miles from Exeter. Mr. Powell, the gardener, told me they were brought home by the celebrated Sir Joseph Banks and presented to the late Earl of Devon. But taking the country generally, to have Camellias at their best they must have the shelter of a glass roof. Artificial heat is not a necessity, as the plants are hardy enough. The protection they greatly need is that of providing shelter for their blossoms, which are exceedingly delicate and liable to injury from wind and rain. Camellias are well adapted for planting in an unheated glass colonnade, which they might be permitted to occupy altogether. Some might be planted to cover the back wall, others trained up pillars

or planted out independently in the borders, so arranging the plants that their brilliant colours are well balanced. In the conservatory they may be used to form backgrounds or centres ; but the *Camellia* is impatient of much fire heat, and is very apt to cast its flower buds if the night temperature in winter is much over 40° to 45° .

If early flowers are required, the only safe plan to adopt is to force the young wood and get it ripened early. By this means I have been able to cut white *Camellia* flowers in September. To do this the plants must be in pots or tubs, and be moved, after they have done flowering, to a forcing house. The same care in cooling down and ripening as is given to forced plants generally will be requisite. Some good cultivators object to place their plants out of doors at all, but if a nice sheltered position can be found, a month or six weeks in the open air after the middle of July will be beneficial. They must never be allowed to suffer from want of water, and should not be exposed to gales of wind.

SOIL AND POTTING.—Various composts are used by different cultivators ; the Belgians grow the young plants, of which so many thousands are annually brought to this country, in leaf-mould, reduced completely, by frequent turnings, mixings, and exposure, to a fine black mould. Many of our nurserymen use peat and sand only ; and though both these systems result in producing plants of a salable size quickly, yet for specimen plants for home use, which are expected to have a long vigorous existence, there is nothing superior to good sound turfy loam, cut about 3 inches thick, from the top of a pasture, and laid up just long enough to kill the Grass. Heavy loam may be lightened with coarse sand, or in some cases a little peat or leaf-mould may be added. The most important items in their culture in pots are turfy soil well rammed in, clean pots, good drainage, and abundant supplies of water when really required. The plants do better placed upon a cool bed of ashes where a certain amount of dampness exists than on a dry, exposed stage. The best time to repot is early in August ; the roots being then in an active state, will take hold of the soil quickly, and be ready to supply the increasing necessities of the advancing buds and the future crop of flowers.

PRUNING.—If any pruning be needed to keep the plants shapely, it should be done when the flowering is over—in spring, just as the plants are breaking into growth. If at any time, through bad treatment, a plant has become leggy and naked at the bottom, and the roots are healthy, it may be headed back into the old wood in spring ; if placed in a warm genial temperature, latent buds will push from the old stems, and in course of time well-furnished plants will be obtained in place of the ungainly naked

ones. If, on examination, the roots of such plants are found unhealthy, the heading down should be delayed for a year, or until, by repotting in nothing but fibry loam, new roots have been made and strength enough generated to cause the buds to start. Cutting off the head of a plant having deficient root action is very likely to kill it. Camellias in a healthy vigorous condition will generally set more flower buds than the plants should be allowed to carry. These should be thinned in autumn to about two or three on each shoot, leaving of course those best placed for effective display. Camellias are much benefited by frequent washings with the syringe or garden engine during spring and summer, especially in the growing season, if required merely for the sake of their flowers for cutting.

PLANTING OUT.—Camellias may, with advantage, be planted against the back walls of cool Peach or Orchard-houses, as the shade such places afford will be beneficial rather than otherwise. I have seen very good results obtained in this way at a small cost. The branches may either be trained closely to the wall, which should be wired for the purpose, or, if there is space enough, a greater freedom of development may be permitted. Lime is poisonous to Camellias, Rhododendrons, and Azaleas. If any is present in the soil, the plants turn sickly and cease to grow, and after lingering a time they die; the only thing that can save them is to change their diet. Camellias never thrive well in the full glare of the sun; under such conditions it will always be necessary to use a thin shade. Mistakes are sometimes made in planting out pot-bound plants into a loose border of recently-prepared soil. I was some time ago examining a case of this kind. The Camellias had been grown in pots for years, and some were pot-bound and were beginning to show symptoms of starvation, when it was decided to plant them into a border which had just been made up in another house. It is probable that when planted the balls were dry, and afterwards they never received water enough to moisten them, although plenty was given; but instead of penetrating the balls it dribbled down by the side, and the leaves, not being sufficiently supplied, lost their colour, turned brown round the edges, and dropped off. When the cause of the mischief was pointed out, the soil made firm round the balls, and a clay basin formed round each plant about as large as the ball to force the water to percolate through it instead of down by the side, matters soon began to improve, and ultimately the plants did well. Still, it requires careful management to turn out a collection of plants that have been many years in pots and have become pot-bound and get them to start nicely in a new situation under

different circumstances. In preparing borders care should be taken that nothing is placed in them which may generate fungus, such as bits of stick, or the half-decayed substances that are often present in leaf-mould. The bracken roots often found in peat are another fertile source of fungus. This is why I should recommend Camellias to be planted chiefly in turfy loam, but it must be free from calcareous matter. A little old manure may be added if necessary, and a sprinkling of soot will also be of great service in maintaining the plants in vigorous health. During the swelling of the buds, and when the plants are in flower, weak liquid manure, made by dropping a bag of soot into a tub of soft water, and still further diluting it before giving it to the plants if needful, will be very beneficial, as soot seems especially helpful to the large glossy foliage when given in moderate doses.

PROPAGATION.—Camellias are chiefly propagated by grafting on the common single Camellia, the latter being obtained by cuttings or layers. I have rooted the double Camellias from cuttings in spring, taken off with a heel, and plunged in a steady bottom-heat. But grafting on the single variety is the best and readiest means of increase. All new varieties are of course raised from seeds, which should be sown in spring in pots or pans of peat and sand, and placed in a little heat to ensure early germination. The young plants must be shaded from bright sunshine, especially when they first appear. At all stages of their growth the Camellias require careful watering. Camellias, like all other plants, may be grafted by approach, *i.e.* the two plants to be propagated are brought close together, and the one in-arched upon the other in a very simple manner by cutting a slice off each and binding the cut surfaces together and keeping them firmly tied till they unite.

LIST OF CAMELLIAS.—Alba plena, Archduchess Marie, Beali, Candidissima, Carlotta Papuloff, Comte de Flanders, Comte de Paris, Conspicua, Countess of Derby, Donckellari, Countess of Ellesmere, Cup of Beauty, Duchesse d'Orléans, Elegans, Fimbriata alba, Henri Favre, Imbricata, Jubilee, Marchioness of Exeter, Mathotiana, Monarch, Napoleon III., Mrs. Abbey Wilder, Optima, Queen of Beauties, Saccoi nova, Storyi, and Tricolor imbricata.

CHAPTER V

Azaleas and Rhododendrons.—For gorgeous effect no class of plants can surpass these. The colours are so clear and bright, and the flowers under good management so freely produced,

that where a dozen or so of varieties are grown the season of blooming may extend over several months. The Azaleas are perhaps the most useful of the allied families noticed above, but the *Rhododendron* is indispensable where forced flowers are required in spring, and the Indian species are well adapted for planting in large cool conservatories. Grafted plants are best, and they may be obtained of different heights, some grafted low down, the lower branches to be trained down over the pot, and the others led upwards to form a cone or pyramid. Others may have stems of different heights up to a yard or more. These latter, when their heads have attained to some size, are very effective over a groundwork of other plants distinct in colour and growth. Any one starting with young plants will have to wait a few years for them to become large specimens, but every year they will become larger, and every year also an abundant crop of flowers will be produced. Making a small plant into a large one is simply a question of time, which the skilled plantsman usually shortens considerably by the judicious application of heat and moisture during the growing season. When the flowering is over, the seeds should all be picked off immediately; the plants should then have a good syringing, and either be placed in some warmer house to make their growth, or grouped altogether at the warmest end of the house, and kept close till the growth is made. After it is completed the plants should be cooled down to harden it, and in July, when the buds are showing up, place the plants in the open air to finish the maturation. They must be housed again before the heavy autumn rains set in.

TRAINING.—Whatever training is necessary should be done after the flower buds are set, but the training of Azaleas is very often overdone. Not only does this excessive formality offend the eye, but it cramps the growth, and sometimes seriously injures the health of the plants. It is like the tight-lacing of the human figure: the strongest may stand it apparently uninjured, but we have no statistics of the number prematurely killed.

SOIL AND POTTING.—Fibry peat, with about a sixth part of clean silver sand, forms the best material for Azaleas. Exact quantities, perhaps, should not be stated, as peat varies in quality, and less or more sand should be used in proportion to its absence or presence in the peat. Potting should be done either just immediately after flowering or just after the growth is completed. No plant should have a larger pot until the one it occupies is full of roots, but young plants should not be allowed to become pot-bound. Old specimens, if the drainage is clear, may be kept in good health for several years without repotting by the judicious

use of stimulants, such as Standen's manure. Great care should be taken with the drainage, which is often delegated to the most inexperienced person in the establishment; but in the case of valuable plants this is not wise, for the health of the plants rests mainly upon its being properly done. The soil must be rammed in firmly. It is scarcely possible, if the soil be in a suitable condition, to overdo it. The roots are so fine that, unless the soil is packed in tightly, they cannot get a firm grasp of it; and besides, when plants (especially fine-rooted plants) are loosely potted, the water runs through too quickly, and drains away from the ball without moistening the roots. It is a common practice to place Azaleas in vineries or peach-houses at work to make their growth, as at that time there is a nice genial temperature in such houses, and the syringing encourages the growth of the Azaleas. In fact the conditions which are suitable to a growing Vine or Peach tree are right for the growing Azalea; but care should be exercised that the Azaleas are free from insects, especially thrips, which, if introduced into forcing fruit-houses, may give trouble. Fumigation with Tobacco is the best remedy for thrips. It should be given two or three times on alternate evenings—damp still evenings are best.

FORCING AZALEAS.—If the wood is made and ripened early, Azaleas may be had in flower early in spring; and if followed up annually, some kinds may be had in blossom before Christmas, beginning first with the old white and the small red variety, called *amœna*, and following on with others in succession. In forcing, it is best to begin slowly and not push too fast the first year, and they will gradually work round until, if a sufficient stock is kept up, they may be had in bloom at least half the year.

VARIETIES OF AZALEAS.—Alba, *Amœna*, *Admiration*, *Brilliant*, *Distinction*, *Dr. Livingstone*, *Chelsoni*, *Coronata*, *Crispiflora*, *Criterion*, *Duc de Nassau*, *Eulalie Van Geert*, *Fielder's White* (the last named forces well), *Flag of Truce*, *Gem*, *Iveryana* (improved), *Le Lion des Flandres*, *Magnet*, *Mars*, *Marquis of Lorne*, *Model*, *Mrs. Turner*, *Neptune*, *Princess Mary of Cambridge*, *Queen Victoria*, *Sinensis*, *Sir C. Napier*, *Stella*, *The Bride*, *Vesuvius*, *Vivid*, *Virginalis*, *Madame Ambrose Verschaffelt*, *Borsig*.

PROPAGATION OF AZALEAS.—There are three accepted modes of doing this—viz. by seeds, cuttings, and grafting. The first-named method is adopted for the raising of new varieties, and stocks for grafting choice-named-kinds upon. The Azaleas strike freely from cuttings of the half-ripened young wood under a bell-glass, either with or without a gentle bottom-heat. I have seen these and many other hard-wooded plants struck in a shady

corner of a cool greenhouse under a bell-glass in summer, acting under the principle of slow and sure, keeping all about them clean and sweet, and trusting to time to carry out the operation, which it rarely fails to do in a satisfactory manner. The rules laid down for striking hard-wooded plants in a previous chapter will apply also to Azaleas, and need not be repeated here. Also, as regards grafting, the treatment there set down is suitable for this class of plants, and I must refer my readers to the chapter on grafting New Holland plants (see Chap. III. p. 162).

THE RHODODENDRON is simply an enlarged edition of the Azalea, and I am now only referring to the tender Indian kinds, which do not flower unless protected by a glass roof. They succeed well planted in a bed of loam and peat, or peat alone in a cool house, or they may be grown in pots or tubs; the latter plan enables us to move them into the open air in summer, which gives scope for rearrangement in the house and benefits the Rhododendrons at the same time. Rhododendrons are so easily cultivated that no more need be said upon that head. Their propagation is chiefly effected by grafting the choice kinds upon common varieties, which are raised from seeds for the purpose. It is an interesting family for the hybridist to operate upon—sure to yield him some kind of satisfaction. *R. aureum splendens*, *R. ciliatum*, *R. Edgworthi*, *R. Countess of Haddington*, *R. jasminiflorum*, *R. Princess Alice*, *R. Prince of Wales*, *R. arboreum*, *R. Veitchianum*, *R. multiflorum*, *R. formosum*, *R. javanicum*, *R. carneum*, *R. elegantissimum*, and many others which I might have named, are beautiful hybrid forms; but where space under glass is limited it will be better for forcing to depend upon plants in pots, and to introduce a sprinkling of the hardy hybrids which can be lifted from the open ground and potted in autumn with buds, and after flowering hardened off and planted out again. Rhododendrons are good plants for the town greenhouse; the leaves, being smooth and glossy, are easily freed from dust and blacks with the syringe or the sponge.

The Greenhouse—SOFT-WOODED PLANTS.—To the cultivator of limited experience this class of plants presents fewer difficulties than hard-wooded plants do; not that no skill is required to bring out all their strong points, but a mistake is less likely to be fatal, and a certain amount of success is pretty sure to reward the efforts of all who possess the necessary perseverance. Order and method are always valuable qualities, and cleanliness should be insisted on in the management of plant-houses, as clean pots and stages, and freedom from dead leaves and flowers, are essential to health. The soil in the pots should

never be permitted to produce Weeds, Mosses, or any vegetable growth other than the legitimate occupants. Where order and cleanliness reign health is generally present, and where the latter prevails insects do not often congregate or cause much annoyance. Among soft-wooded plants the green-fly is generally the most troublesome, and in glasshouses that can be kept close Tobacco smoke is the best remedy. If applied in time—*i.e.* as soon as the presence of the flies is observed, or as soon after as a suitable evening can be had—two moderate smokings on two separate evenings, with one or two days intervening, will generally suffice to destroy them all. Tobacco does not appear to destroy the eggs of the insects, so when the plants are allowed to become infested several smokings at intervals will be required to clear them off. A damp calm evening is the best for smoking, as the moisture fills up the laps of the glass roof and prevents the smoke escaping, and a much less quantity will suffice to fill the house. Smoking plant-houses in dry windy weather, unless they can be covered over with canvas, or something to keep the smoke inside, is like throwing time and money away. The foliage of the plants should be dry at the time of smoking. I have tried various substances saturated with Tobacco juice for fumigating, but paper, when it has been well saturated with the Tobacco liquor and dried, is as cheap and good as anything; in fact it is better than most things sold for the purpose. Various contrivances have been from time to time offered by enterprising people for the burning of Tobacco in its different forms in plant-houses. I have tried a good many, but I do not know anything better than a strong wire basket woven closely, with two or three live coals in the bottom, and the paper, which should be pulled into rather small pieces and placed on the coals, completely covering them up. The Tobacco paper should be placed on the fire before the basket or whatever machine is used is taken into the house, and when fairly started there is no occasion for the operator to remain inside with it. When the house is full of smoke, so that he cannot see from end to end, he may step inside and remove it, but otherwise if all goes well he need not remain inside. On no account must the paper be permitted to flare; if it does, the foliage of tender plants will suffer. If the paper is too dry, damp it a little with a fine-rosed waterpot; and it is always advisable to keep the waterpot handy during the time the operation is going on in case the machine should get too hot. This does not often happen in the hands of experienced people, because they know how much fire is needed, and also how much paper to place on to do the work quickly and well. It is better to have a few well-grown specimen plants than a number of

leggy, drawn skeletons that cannot be moved for fear of exposing their nakedness. No two plants should absolutely touch each other on the stages when growing, and of course, if we start with a collection of *Pelargoniums* or any other plants in spring, as the season advances they will require double the amount of space if justice is to be done them. And the question will come up for decision, Shall we have a few well-grown plants, or permit all to remain and have nothing but clusters of foliage bearing a few flowers at the tops? The proper course is to keep gradually weeding out the worst plants as the space is required for the best—taking care, by frequent change of position, that every side of the plants has a fair share of light. It is not often that the thinnings of the greenhouse need be thrown away; there are usually cold frames which will afford protection enough with a covering of mats after the middle of March, and sometimes the weedings from the greenhouse make excellent plants later on when treated to a cool regimen. In the majority of greenhouses in the country, especially in small places, too much artificial heat is employed at night when there are no means of correcting the aridity of the atmosphere by the admission of fresh air. In cold weather ordinary greenhouse plants will take no harm if the thermometer falls to freezing point, if they have at no time of their existence been coddled. Of course when the thermometer reaches 32° it is verging on the dangerous; but I want to impress upon my readers that it is better, in severe weather, to permit the temperature to fall as low as is consistent with absolute safety than to keep nervously firing away, and by so doing lower the vital principle of the plants and make them fall an easy prey to insects. Keep the fire low and steady, at the same time consult the barometer and thermometer, so as to anticipate any atmospheric change, and not prepare for a cold night by extra firing, and find on rising in the morning that a thaw has set in.

WATERING.—This should be done with judgment and care, especially in winter, selecting the bright sunny mornings, when the lights can be opened to let out the damp, to give all that need it a liberal allowance. Never water a plant at all without giving enough to run through. It is a common fault with young hands to pour a little on the top without taking the trouble to ascertain if the whole of the soil is moistened, and after a time the ball at the bottom, where all the best roots are situated, becomes dust dry. I have already said something about

VENTILATION, and its importance cannot be overrated, nor its influence upon growing plants exaggerated. The condition of the air, its relation to the external atmosphere, its purity and aridity,

are matters of detail requiring careful attention. If the chief object is to keep the plants in health, then the lowest temperature that will ensure regular steady growth is all that is needed. The night temperature should never exceed 40° , and may fall in extremely cold weather, as I have stated, even to 32° without doing much harm if there is a little fire going. The best constructed houses are not air-tight, and in frosty weather, or when a keen wind is blowing, sufficient fresh air may get in through the chinks and crannies without opening a light at all, and cold draughts should always be avoided.

THE SOIL for soft-wooded plants need not vary much. In this respect our predecessors very often complicated matters by the various ingredients they mixed up in their soils. September is a very good month for laying in a stock of potting soil, which should consist of two-thirds top spit, 4 inches thick, from an old common or pasture, and one-third manure, packed up in alternate layers of horse droppings in the proportion I have stated; and the heap should be built up in a ridge-like form to throw off the wet, and should remain for six months, or till the grasses are killed. I have for special things used horse-droppings, with the grit as gathered up in the road mixed with it. Carnations, etc., do well in this with the usual proportion of loam, and it will grow all soft-wooded plants with the greatest perfection.

POTTING.—Pot firmly in order to ensure a free-flowering habit; loose potting leads to gross growth and large leaves, which are always accompanied with a paucity of flowers. Shift on young plants before they become pot-bound and stunted, as they, like young animals, seldom cast aside the effects of a starved youth.

CHAPTER VI

The Pelargonium—SHOW AND FANCY.—In treating of the life-history of a plant, the simplest way is to commence at the beginning, which in this case will be with

PROPAGATION.—Though cuttings of Pelargoniums may be taken and rooted any time, yet, except in the case of choice, scarce sorts, the best time is immediately after flowering, when the wood is firm and ripe. If cuttings are plentiful, only the best need be selected, as strong ones always make the best plants. The old stems of new or scarce sorts, if cut into lengths of two or three joints each, will, in most cases, root and make plants, inferior of course to good, strong, leading shoots, but still useful. In certain cases cuttings of the roots may be utilised, as thick fleshy

roots, cut into pieces an inch or two long, and planted thick-end upwards about level with the surface of the soil, which should be sandy, will, most of them, push forth latent buds and grow into good plants. Until started they should have, if possible, a little bottom-heat to push them on into growth before a loss of vigour takes place from drying. The pots and pans of cuttings taken from the green shoots will strike very well on a shelf near the glass in a warm greenhouse, if in an equable state as to moisture. Where properly attended to in this respect, no shading will be required. Cuttings will root in the open air or in a frame, but I have always found those rooted on a shelf near the glass in the full sunshine make the sturdiest and best plants.

POTTING.—By October even the latest of the cuttings should be rooted sufficiently to pot off if good flowering plants are required the next season. Sandy loam, with a fifth part of leaf-mould, will suit them well at this stage. The pots should be proportioned in size to the strength of the plants, potting the strongest into what are termed large sixties, or about 4 inches in diameter, the small plants to have 3-inch pots; but in private places, unless a large number of plants are required or the kinds are new and scarce, it is hardly worth while to pot the weakly plants, as they never overtake the others; and it is better to grow a moderate number of good plants, and grow them well, than waste time and space on others which no amount of skill can turn into good specimens. Every propagator knows that even when he has scope for the selection of the cuttings, a certain proportion of the plants he raises will be weaklings, and will not, if potted, grow into healthy specimens, and usually these are discarded at once to save disappointment. Clean pots, careful drainage, and firm potting are essential in *Pelargonium* culture. The latter item is often disregarded, as a plant loosely potted by its rapid growth at first pleases the inexperienced plant-grower, and he rejoices in his broad foliage; but such plants do not flower well. A densely floriferous habit can only be secured by fairly firm soil.

POSITION AND TEMPERATURE.—*Pelargoniums* must always occupy a position near the glass. The house for this class should, if it is convenient, be fitted with a movable stage, raised and lowered at pleasure, dropping it down when the plants open their blossoms. But it is specially important that during the short, dark days the plants should be near the glass, as it is then that the foundation for future success is laid. As growth proceeds, the terminal buds should be taken out to induce them to break back and assume a bushy habit. The plants

should never absolutely touch each other on the stage, and if the house is a lean-to they should be frequently turned round to keep them well balanced. Ventilate whenever the weather is mild and calm, but never permit cold currents to blow through the house, for if the plants once get a check from this, or indeed any other cause, green-flies will soon make their appearance, and it is only by making a regular steady progress that really superior results can be obtained. Plants that are making active growth all winter, and necessarily so, must have a regular temperature of about 45° at night. A large amount of moisture need not be used, as a damp atmosphere would encourage too much leaf-growth. If the house can be opened a little every day to change the air and keep up the circulation, no harm will come from shutting out all cold winds and draughts, but a benefit will be secured. About January the plants should be placed in their blooming pots, as it is better to pot early and grow steadily.

WATERING must be done carefully, for if too much be given and the soil becomes sodden, the plants never do much good afterwards, and a disease known as the "spot" can generally be traced, when present in a collection, to sluggish root action induced by over-watering. The size of pot most suitable for one-year plants is 5 inches or 6 inches in diameter. Very nice little blooming plants can be grown in 5-inch or 6-inch pots, as, when the pots are well filled with roots and the flower buds are pushing up, liquid manure can be frequently given. The soil for the last shift may be rather richer, and the turf chopped a little coarser, ramming it down with the potting stick. At least an inch of clear space should be left at the top of the pot to hold water, as very liberal supplies will be needed when the plants are in blossom. As the days lengthen and the sun gains power, the syringe may be advantageously used on bright days, using it in the morning at first, but afterwards, as the season advances, in the afternoon; but the leaves must be dry before night, as damp, if it remains long on them, may induce decay. Endeavour to maintain the plants in robust health, and then the green-fly will not give much trouble. It will be advisable to fumigate occasionally as a preventive, even if flies are not present in large numbers, and especially just before the flowers begin to expand; if done after the flowers are open, strong doses of Tobacco smoke will make the petals drop prematurely. Very little support will be required for plants which have been firmly potted and grown near the glass, but whatever may be necessary should be supplied before the flower buds open. The stakes should be neat, inserted carefully, and kept well within the foliage, so as not to be conspicuous. If one stake is

enough for a plant, no more should be used ; but in after years, as the plant gathers size, more training will be needed in order to show the flowers off to the best advantage.

TREATMENT AFTER FLOWERING.—When the flowering is over, stand the plants in the open air to ripen the wood and prepare them for cutting down. Pelargoniums of the second year will make handsome specimens, and they may be kept in good condition for many years, gradually increasing in size. The largest specimens may be grown in 11-inch pots. After the annual pruning, the plants should be kept rather dry till the buds push, which will be in the course of a fortnight. When the young shoots are half an inch long, shake the plants out of the old soil, prune the roots, and repot in clean pots as small as the roots can be conveniently got into, using nice, sweet, turfy soil. From this time forward they should occupy a light position near the glass, and early in January be shifted into the blooming pots. In this way a collection of really handsome specimens may be kept for many years in small pots without any falling off in their beauty or health. The round bush shape is the form generally adopted as being the most natural, and as a rule the form that is the most natural is the most appropriate and effective. I remember about twenty years ago seeing a number of plants in the conservatory at the Botanic Gardens, Regent's Park, trained as pyramids, and they were very effective. They were about 6 feet high, and remarkably well furnished. It is just possible that some of my readers may have noticed these plants. It would take some time to grow them to that size, but to my mind it seemed a pleasant way of breaking away from the ordinary flat-headed form filled with sticks. The pyramids only require one stake in the centre ; but during the early life of the plant the shoots are linked down to the pot by strings of matting, and with careful management such plants, when once formed, will live in good condition many years. I do not say that every variety could be trained to form a pyramid 6 feet in height, but all the most vigorous growers of the show Pelargonium section, and also the zonals, might easily be run up to any reasonable height. In starting with a young plant, the main stem is tied to a central stake, and the manipulations of the side branches by pinching and training are all carried out with a view to the plants assuming that particular shape, at the same time taking care that while the upward tendency is encouraged the bottom is allowed to make reasonable progress to maintain the proper balance.

PERPETUAL PELARGONIUMS.—Of late years greater notice has been taken of a most useful section of perpetual or early-blooming Pelargoniums, of which the old red kind, called Gauntlet, and the

white alba multiflora may be taken as the type. Though hardly reaching the florist's ideal, yet they are exceedingly useful for home decoration and for cutting very early in the season, when *Pelargonium* blossoms are very valuable. Their treatment in the main features is similar to those I have given above. The cuttings would have to be taken and the plants pruned back to suit their special season of flowering, and I have no doubt that, with the aid of this section, *Pelargoniums* profusely bloomed may be had all the year round. The winter-flowering plants will require a brisk temperature to keep them moving rapidly on, and a light house to build up the growth usefully for the object in view. Those few autumn bloomers would be best in the open air in summer on a coal-ash bed.

THE ZONAL PELARGONIUM.—This is a race of comparatively modern development, and, like the preceding section, owes a great deal to the hand of the hybridist. The improvement that has taken place in the size, shape, colour, and substance of the flowers during the last twenty years is something marvellous, and equally rapid strides have been made in altering the character of the foliage; but all things find their proper level in time, and *Pelargoniums* are no exception to the rule. The scarlet-flowered section of Zonal *Pelargoniums* are perhaps the most valuable for decorative purposes. They are now to be had in all shades of colour between white and scarlet. Some are tinted with purple and yellow, whilst others are striped and blotched in a singular manner. From this large section have been drawn all the best bedding varieties as well as the large-trussed ones, which are so valuable for pot culture, and, by a judicious selection, may be had in bloom all the year round. For autumn and winter, young spring-struck plants grown in the open air all summer in the full sunshine will produce the finest trusses. They should not be over-potted, and the last shift should be given not later than the first week in August. The plants should either stand on a coal-ash bed, or on bricks or boards, so that worms cannot enter. Worms in a pot are something like the proverbial bull in the china shop—they soon do a lot of mischief, even if expelled whenever their presence is noticed. During the summer all flower buds should be picked off and the terminal growth-bud pinched out of the most vigorous shoots, to induce a dwarf, sturdy habit. They should be housed in a warm light greenhouse in September, where they can occupy a position close to the glass. A light span-roofed house is the most suitable. The second year such plants, if potted in a fibry loam and a little old manure, will make grand summer and autumn plants for conservatory, or for vases in the open air, or to form groups in some sunny corner.

SCENTED-LEAVED PELARGONIUMS.—These should be cultivated in every garden for their beautiful foliage to mix with cut flowers, and many—indeed most—bear very pretty flowers in addition to their sweet foliage; and the Ivy-leaved section, which has increased in variety and beauty so much of late years, is indispensable for basket work and planting in beds and on rockeries, and other positions in the open air, or for clothing low walls, trellises, or pillars. Those who have only grown these and the preceding section in pots can form no idea of their rapid growth when planted out under glass. A wall 10 feet high is covered in about three years in a most delightful manner with glossy green foliage, sprinkled over with various coloured flowers, when a mixture of kinds are planted.

THE CAPE PELARGONIUMS, with woody stems, in some instances armed with spines, are very pretty for buttonholes or bouquet-making. They were much more common years ago than they are now, even with the revival which has taken place lately, and they, or at least the best of them, are probably destined to come to the surface again. Though lists of soft-wooded plants may not possess the value that would attach to more permanent things by reason of the constant change which is going on, yet I have thought very short and select lists may be useful to some of my readers, and therefore I append the following

VARIETIES—*Show Pelargoniums.*—Crusader, Criterion, Devastation, Diana, Dictator, Icelandic, Illumination, Majestic, Silvio, Symmetry, Archduke, Aurora, Challenger, Enchantress, Judith, Kathleen, Mrs. A. Matthews, Mountaineer, Duchess, Rising Sun, Ruth, Blue Bell, Achievement, Duke of Cambridge, Claribel, Consequence, Chameleon, Highland Lassie, King Charles, Maid of Honour, Purple Gem, Robin Hood, Troubadour, Sunray, Mary Hoyle, and Hector.

Fancy Pelargoniums.—Janette, Miss Emily Little, Mrs. Milne-Home, Silver Cloud, Thurio, Phyllis, Clementine, Ann Page, Rosy Morn, Countess of Dudley, Duchess of Edinburgh, Acme, Princess Teck, Bridesmaid, Mrs. Ford, Juliet, Decision, Lucy, Mrs. Dorling.

Regal Pelargoniums.—These are very showy. Beauty of Oxtou, Queen Victoria, Princess of Wales, Mdme. Thibaut, Prince of Novelties, Marie Angus, Dr. Masters.

French Spotted Pelargoniums.—Achille Richard, Mdme. Charles König, Graham Bell, Prince Arthur, Gloria Patriæ, Midas, Duchess of Edinburgh, Digby Grand, Perle Blanche, Fire King, Triomphe de St. Mande, Prince Charlie, Magnet, Kingston Beauty, Mrs. L. Lloyd, Firebrand, Marie Lemoine, Hebe.

Early-flowering or Forcing Pelargoniums.—Rosea multiflora,

Decorator, Defiance, Zulu Belle, Criterion, Vivid, Charles Outram, Miss Bradshaw, Mrs. Bradshaw, The Moor, Gloire de Paris.

Zonal Pelargoniums for pot culture in winter.—Commander-in-Chief, Guinea, Beatrix, Colonel Seeley, H. M. Pollett, Lizzie Brooks, Kleon, David Thompson, Mrs. Whitley, Polyphemus, Alonzo, Gnome, Dr. John Denny, White Clipper, and Lady Sheffield; Vesuvius in various shades.

Though young plants produce the finest trusses, older plants that have stood out-of-doors all summer, and are hard and well ripened, will produce a greater quantity of bloom for cutting if introduced to a high temperature in December. And as in this case the plants are simply grown for cut flowers, they can be placed in a warm light corner of the stove or some forcing-house, where a night temperature of 60° is kept up. Years ago I have forced the old Tom Thumb in this way, selecting old plants that had been starved in the sunshine. Shorten them in a bit, and then push them on in heat. The various forms of Vesuvius and many others force well.

Double Zonal Pelargoniums.—Wonderful, Emily Laxton, Meteor Flag, Gambetta, F. V. Raspail, Mrs. Charles Pearce, Una, Coquette, Jules Simon, Marie Lemoine, Madame Thibaut, Violet, Bellona, President Leon Simon, Cæsar Borgia, Floribunda, Maud, Henry Cannell, Souvenir de Castille, General de Galliffet, Aurora, Heroine, Alba perfecta, Candidissima plena, Progress, Enchanting. There are such an immense number of doubles in cultivation now, that the work of selection to secure the best in each colour is somewhat difficult.

Scented-leaved Pelargoniums.—Lothario, Grandis odorata, Capitatum, Little Gem, Quercifolium, Q. minor, Fair Ellen, Tomentosum, Prince of Orange, Lady Mary, Shottesham Pet, Lady Plymouth, Crispum, Denticulatum majus, Filicifolia odorata, Radula minor, Radula major, Pheasant's-foot, Unique in several colours. The above section, when well grown, will be most interesting and useful.

Ivy-leaved Pelargoniums.—Mont Blanc, Madame Crousse, Lucy Lemoine, König Albert, A. F. Barron, Viscountess Cranbrook, Rosette. The above produce double flowers. Mrs. George, Diadem, Gem, Bridal Wreath, Argus, Innocence, Mrs. H. Cannell, Alice Lee, Dolly Varden, Peltatum elegans.

Hybrid Cape Pelargoniums.—Echinatum, Rosy Morn, Erectum, Spotted Gem, and Beauty, a hybrid from Echinatum. This class should be shaken out and repotted in spring for autumn and winter forcing.

CHAPTER VII

The Fuchsia.—For grace and beauty the Fuchsia has but few superiors. Planted out under glass and trained up a rafter or a pillar, or against a wall, or made to assume the bush, pyramidal, or standard form in the border, it forms a most ornamental object. As a pot plant the merits of the Fuchsia are well known. It will blossom finely in the smallest pot, or it may be had 10 feet high, clothed from base to summit with magnificent drooping wreaths of flowers; and its cultivation is so very easy and simple that the most inexperienced person need not fail to obtain a fair amount of success. It is true, of course, that the very best results—the highest pitch of excellence the Fuchsia is capable of being brought to—can only be obtained by the exercise of a considerable amount of patient skill.

STRIKING CUTTINGS.—The best time for propagation is early in spring—the earlier the better. A plant or two of each kind should be placed in a pit or house having a temperature of 60° or so, and when the young shoots which will speedily burst forth are about 2 inches long, take them off and insert in pots of sandy soil (round the edges preferably), and plunge in a hotbed of 75° to 80°. To produce really handsome plants in the shortest time, the cuttings should be potted off as soon as they are rooted singly in small pots. If permitted to stand in the cutting pots till the roots extend and interlace, not only is time lost, but they receive a check which is detrimental to them; therefore, as soon as the cuttings have made roots, lift the pots from the plunging material on to the surface of the bed, and leave them there a day or two to harden. When that is accomplished, pot off, using warm pots and soil, the latter to be light and friable. From this time forward, the chief end and aim should be to grow the plants right on till they occupy their blooming pots without a check. Fuchsias are very susceptible; the least check during the spring or early summer throws them into bloom, which retards their growth. The growth of a Fuchsia in a pot should be made before it begins to show a blossom, as, although we may pick and pinch, there is no more useful work to be done after the blooming habit has been developed. The plants during growth must never be allowed to become pot-bound, to suffer from want of water, be chilled by exposure to cold drafts, or checked for want of atmospheric moisture. A light house, with a moist atmosphere, where the temperature does not fall below 50° at night, suits them nicely. A low pit will do well for the first few weeks, but they should not

have bottom-heat, as its tendency is to cause over-luxuriance, which soon shows itself in strong shoots breaking away, and necessitates stopping and pinching. If good-habited kinds are grown in the right way, there should not be much stopping or pinching required, as the plants will assume a natural pyramidal outline without it. If, through over-potting or any other cause, any shoots outgrow the others, they must of course be stopped in their career, to prevent them becoming robbers; but the very best one-year-old plants I ever saw had never been pinched, and their outline was absolutely perfect. They were grown under the most favourable conditions as to warmth and moisture, they had never received a check, and had never been over-pushed, but had been taken along steadily, exposed to plenty of light to build up the growth as it was made. A little ventilation in the early part of the day, but closing early in the afternoon, and filling the air with moisture, seems to furnish just the conditions suitable for rapid, well-balanced, well-set up growth. Fuchsias in a young soft state may perhaps, in some cases, require a little shade on bright days; but if shade be used it may always be taken off when the house is closed, and the syringe should be used freely.

POTTING.—In potting Fuchsias, always shift into larger pots as soon as the roots push through the ball and begin to form in clusters round the sides, though large shifts should be avoided for a reason I have already alluded to—viz. it encourages gross growth. If the plants are required to be in bloom for any special occasions, the flowers should be pinched off till within six or seven weeks of the time they are wanted in full flower. And if fed with liquid manure, and shaded from bright sunshine, they will continue in great perfection a long time. Some cultivators recommend autumn propagation for the principal specimens, and I have often struck them at that time to have young plants as large as possible early in the season. The cuttings do not root so readily at that season, and are more difficult to obtain, as flowering shoots do not make good cuttings. But good cuttings can generally be obtained in August from plants turned out, or that have been standing in the open air some time in a shady place. To obtain the full advantage from autumn propagation, the young plants must be kept moving all winter on a shelf near the glass in a warm house. The object is to obtain an early start in spring, and if kept moving on steadily through the short days they will be far in advance of anything struck in spring. Keeping Fuchsias in winter in a resting state involves no trouble, the usual plan being to put them away under the greenhouse stage till growth becomes active again, and then prune into shape and repot. They should not be kept abso-

lutely dry, or the plants will not break so freely in spring. After repotting, warmth and moisture are essential to induce plenty of buds to break, and great assistance may be rendered to ensure a perfect outline by depressing a shoot in one direction, or elevating one in another, so as to regulate the flow of the sap, equalise the growth, and keep the plants well balanced. To obtain large plants, pot on with judgment as fast as the roots work through the new soil. Fuchsias may be kept in good condition for many years, but unless very large specimens are required it is hardly advisable to keep the plants more than two or three years. The old plants that are annually cast off will come in useful to plant in groups about the grounds or in shrubberies. By picking out all the bottom eyes of young vigorous plants, so as to have a foot or more of clear stem, and allowing the shoots above that height to grow out unstopped, falling over the edge of the pot, very handsome little specimens may be obtained for a drawing-room stand, or dinner-table decoration; and the flowers of Fuchsias, when the growth is encouraged to fall gracefully over, drooping downwards in a natural fashion, show themselves off to the best advantage.

When the baskets are not too small, and they can be well supplied with water, a good way of making the most of old plants is to cut them down. When they break, thin the shoots to half a dozen or so, let them grow out as dwarf-spreading bushes, and plant in baskets for suspending in the greenhouse or conservatory.

RAISING SEEDLINGS.—Any one can do this, as the plants seed freely, and those with a taste for hybridising may gather together a dozen or so of the most distinct varieties. Cover the ventilators over with canvas to keep out bees, and operate with the camel-hair pencil, afterwards washing the seeds out from the pulp of the fruit; dry them, and sow in heat in spring.

VARIETIES—*Dark Varieties.*—Lord Falmouth, Sir W. G. Armstrong, Hercules, Wave of Life, Letty Lye, James Lye, Prince of Orange, Victor Emmanuel, Pride of Woolwich, Champion of the World (double), Prince Leopold (double), Sir Garnet Wolseley (double).

Light Varieties.—White Souvenir de Chiswick, Beauty of Swanley, Covent Garden White, Mrs. J. Lye, Guiding Star, Fairest of the Fair, Starlight, Annie, Earl Beaconsfield, Aurora superba, Kingsburyana, Miss Lucy Finnis, Mrs. H. Cannell.

Begonias.—We now possess Begonias in all colours, from white, yellow, and red, specially adapted for greenhouse culture, and these may be utilised in summer for planting in the open air in positions sheltered from cutting and boisterous winds. The tuberous-rooted Begonias are of comparatively recent origin, and

are most useful for summer and autumn decoration. They fill up well in the greenhouse or conservatory after the *Pelargoniums* and other early-blooming plants are past their best; the colours, too, are bright, and they flower continuously for several months. When the flowering is over they may be stowed away in a cool place. We pack them away thickly on the border in the orchard-house; if they have been grown in pots, they are turned out, the balls packed closely together to economise space, and a little fine sandy soil scattered among them to fill in all the interstices between the balls. In this condition they may remain till growth becomes active again in spring, or, if early-blooming plants are required, they may be potted in February and plunged in a gentle hotbed in a pit or frame. They require to be kept just moist in winter, and in a cool place—treating them as I have suggested—very little water will suffice. If kept too dry, there is danger of their perishing. They may be wintered beneath the stage in the pots in which they grew, in a cool greenhouse, but should be shaken out and repotted as soon as the eyes start.

PROPAGATION.—An easy way is to divide the tuberous kinds in spring. When the earth is shaken away it is an easy matter to take off rooted cuttings with a sharp knife, as usually numbers of eyes will start. These, if potted and placed in heat, will make strong plants in a little time. They may be rooted from cuttings of the shoots the same as other *Begonias*, but they do not take kindly, and are a long time rooting. The quickest way of getting up a large stock is to sow seeds. Very often the seeds drop about on pots and borders during the summer, as they seed very freely, and grow in large numbers. These may be lifted in patches and planted in the frame to acquire strength. When the seeds have been saved with care from good varieties, all the plants raised will be good enough for decorative purposes, and some, doubtless, will be worth perpetuating. Good-sized specimens can be grown in one season from seeds if they are sown early in March, and are helped on in a close warm pit till Midsummer. The seeds are very small, but any one who can get up *Calceolarias* or *Gloxinias* will succeed with *Begonias*. The soil in the pots should be light and sandy; if it is made firm and well moistened before the seeds are sown, the merest sprinkling of sand will suffice for a covering. The longer seeds of so diminutive a nature remain in the earth before they germinate, the more danger there is of their not growing at all, or at least starting away so weakly as not to make good plants in a reasonable time; therefore they should be plunged in a gentle hotbed at once. The seeds must be sown thinly, as a tendency to debility is often engendered in the seed pot by thick

sowing. Place a square of glass over the top of the pot to keep a moist atmosphere around the seeds and render watering less necessary. Unless the watering is carefully done, the very small seeds are easily carried down too deep for germination. A good way of watering such things is to dip the pot in a pail of tepid water, but not allowing the water to flow over the top. Sufficient moisture will be imbibed through the bottom and the porous sides of the pot for the wants of the seeds in a very short time.

POTTING.—When the young plants are large enough to handle, prick off into pots or pans an inch apart, and return to the pit, and as soon as their leaves meet in their new position pot off singly into 3-inch pots and shift on as they require it. Turfy loam and leaf-mould will grow them well, and a little peat and sand may be added for choice varieties. Crushed charcoal or charcoal dust is valuable to mix with the soil for all this class of plants, but very rich manures should be avoided. The branches will require a little support as they progress. In most cases, one stake in the centre (or as near the centre as it can be inserted, for it must not be thrust into the tuber) will support the whole plant by linking up the shoots with strings of matting, and the plants will have a better appearance trained in this way than if each shoot is tied up stiffly close to a piece of stick. Gather seeds from the best varieties only, and the stock will improve. It is a good plan to place those having the best flowers by themselves, and use the hair pencil among them.

Besides the tuberous Begonias there is an older race of that plant very well suited for the greenhouse or conservatory, some of which, including *insignis* and *manicata*, are winter bloomers of very great merit. Cuttings of these should be rooted early in spring, and they should be potted on and kept in a close pit till the middle of June, when a little more ventilation may be given. Nice little specimens in 5-inch pots may be grown in one season from cuttings rooted in February. If large specimens are required for any decorative purpose, cut down the old plants and start them from the base again in spring, or, better still, when giving the last shift, put three young plants into a 10-inch pot, and grow on well. This treatment refers more especially to the free-growing kinds, such as *insignis*, *fuchsioides*, *Ingrami*, *Weltoniensis*, *Sutherlandi*, *semperflorens*, and others of a like nature.

The Cyclamen.—Though usually classed as a greenhouse plant, yet, to bring out its great decorative qualities properly and make the most of the power which its rapid increase from seeds of late years has placed in our hands, a warm pit or frame (to bring on the plants in their early stages) is needed, in addition to the green-

house. No class of plants has made more progress of late years, and this has been mainly due to the perspicuity of a few market-growers, who recognised its fitness for a market plant. It is especially an amateur's plant, as the small light houses of the villa gardens are better adapted for the culture of this class of plants than the larger, more lofty structures often to be found in extensive gardens.

SOWING THE SEEDS.—When a little warmth can be ensured all winter to keep the plants moving on unchecked, the seeds may be sown in August, in pots or pans well drained, and filled to within an inch of the top with sandy peat, covered with the same kind of material, or else with pure sand, and the pots should be either covered with Moss till the seed germinates or else have squares of glass placed on the top. The pots should be placed in a gentle bottom-heat, if available; or, if not, in some nice genial situation, where the seeds will soon begin to move. The seeds soon vegetate if kept warm and moist, and when large enough to handle prick them off into pans or boxes of light rich soil about an inch apart, still keeping them in a warm situation shaded from bright sunshine. After they become established and gather strength, each plant may have a pot to itself, putting them in 3-inch pots at first, and afterwards shift into 5-inch; the very strongest may have an additional shift. As the season advances and the sun gains power, they will do better in cold frames at first kept rather close, but afterwards more freely ventilated. During the hot days of July it will be advisable to syringe a little thin limewash over the glass to soften the sun's rays, and the first week in October they should be moved into a light warm greenhouse near the glass to flower. Plants so treated, if all has gone well, will make grand clusters of handsome foliage and brilliant-coloured flowers. Nice little blooming plants can be obtained by sowing the seeds in a hotbed in February, and growing them on rapidly through the spring months and transferring to the frames when hot summer comes. The plants producing the best flowers should be placed on one side for seed-bearing, and as they seed freely and can be grown into a flowering size in one year under good management, some growers do not save the old bulbs year after year, as was commonly done twenty years ago.

TREATMENT OF OLD BULBS.—Shake the bulbs out after resting, repot and plunge in Cocoa-fibre in a cold frame during summer. During the flowering season maintain a genial buoyant atmosphere; if too much moisture is used, damp will lodge about the crown and the flower stems, and occasionally the leaf stalks decay. Loam and leaf-mould, or good peat in about equal portions, with

sand and crushed charcoal added to make it porous, will suit them well. In potting, the crown of the bulb must be kept well above the soil, as the damp injuriously affects it when buried too deeply. Careful watering is necessary, especially when in flower, and green-fly must be watched for and promptly destroyed.

CHAPTER VIII

The Cineraria.—Seedlings of these are now so good from carefully-selected strains that it is scarcely necessary to grow named kinds for house decoration merely. Sow in March for autumn blooming, about the middle of April for flowering in winter, and again early in June for spring display. The March sowing should be placed in a hotbed, and the April stock also should be raised in a gentle heat. The June plants will succeed very well on a shelf in the greenhouse, with a piece of glass over the pot or pan. As soon as the little plants appear, stand the pots near the glass, but shade from bright sunshine. When strong enough to handle, prick off into pans an inch apart, and as soon as more space is required pot off singly into 3-inch pots. After they are fairly started on a separate existence, Cinerarias do not require artificial heat. A close frame, with the bottom thickly strewn with coal-ashes, is the best place. When the sun gains power, stand the frame in a cool partially-shaded position and allow plenty of space for the plants to grow, so that the leaves do not touch. Plenty of water at the roots and a moist atmosphere are essential to clean rapid growth. Shift the plants on into larger pots as they require it, ventilating freely to induce sturdy vigorous growth, drawing the lights off altogether in warm weather. Two-thirds turfy loam to one of old hotbed manure, adding sand or crushed charcoal to give the necessary porosity, seems exactly the soil to meet their requirements. If kept too warm and close, or permitted to suffer for want of water, green-flies soon make their appearance; their presence may be looked upon as evidence of the plants having received a check, or of some irregularity in their treatment. If insects should attack them the only course is to fumigate with Tobacco; and as the leaves are tender and very susceptible to injury from an overdose, the operation must be done with care. When the leaves are quite dry, give two or three smokings, with an interval of a day or two between, rather than run any risk of overdoing it. In dealing with insect pests, promptitude is a great virtue. Nice decorative plants may be grown in 6-inch pots, and 8-inch pots will suffice for larger

specimens. In any case it is best not to over-pot. Great help may be obtained from the judicious use of liquid manure when the flowers are coming up, but free drainage is essential to keep the foliage in good colour.

SAVING SEEDS.—When a good strain has been obtained, place a few of the best and most distinct varieties on one side for seed-bearing purposes, and gather the seeds as they ripen. Cinerarias should stand on a cool bottom, and even in winter they will do much better if only enough fire-heat be used to keep out frost effectually. Double-flowered Cinerarias were originated on the Continent a few years ago, and are now pretty well scattered through the best gardens in this country. The best varieties have flowers as double as a *Ranunculus*, are exceedingly pretty, and last much longer in a cut state than the single forms do. They can be raised from seeds, and by obtaining packets from the best sources, saving those plants producing good flowers, and propagating from offsets, a good strain can be originated with but little trouble.

The Herbaceous Calceolaria.—Sow about the middle of July in pots of light rich soil made firm, water with a fine-rosed pot; and when the soil has had time to settle, scatter the seeds thinly on the damp surface, cover lightly with silver sand, place a square of glass over the top of the pot, standing it in a close place, and shade from bright sun; a close handlight will do. If the pots are plunged in Cocoa-fibre, no watering will be required till the seeds germinate, which, if they are good and new, will be in about a fortnight. Prick off into boxes of light rich soil when large enough, and transfer to a cool close frame, placed at the north side of a fence. As soon as the leaves of the plants meet, transfer them to single pots, and shift on as they require more space, still following up the cool treatment till October, when they should be taken to a cool house, where only heat enough is employed to keep out frost. Calceolarias are at all times rather chary of bright sunshine, and if much exposed to it the leaves lose that beautiful deep-green colour which is such a set-off to the brilliant blossoms so freely produced in spring by healthy plants. The plants during the growing season must not be allowed to become pot-bound, and much injury will be done if they ever suffer for want of water. If they must at any time occupy a position on a stage, cover the stage with green Moss. About equal parts of turfy loam and manure, with a sprinkling of charcoal dust, is the best compost for them, and they need not be potted quite so firmly as is desirable for most plants. Calceolarias will succeed very well in a house with a north aspect, moving them into the conservatory to flower. Of course the hardier the plants

are grown as regards ventilating, the better will they endure dry afterchanges. The flower spikes should be supported with light sticks. Being so beautiful, and so distinct from all other plants, they are worth some trouble to obtain in the best possible condition. Coolness and dampness are the chief requisites, and under such conditions insects are not troublesome; but if green-fly appears, fumigate in moderation at once, and repeat if necessary. Liquid manure should be given frequently as soon as the flower spikes show. To save seed, gather the best plants together, and use the camel-hair pencil at frequent intervals. Without a little help the seed crop will be scanty.

Primula sinensis and Varieties.—The single and semi-double kinds should be sown in March or April, according to the time they are required to bloom. Cover the seeds rather deeper than would be necessary with many seeds of similar size, as they are slow in germinating; indeed the watering often displaces the covering before the seeds make a start, and consequently they fail to grow, although a covering of moss or a sheet of paper would, in a measure, obviate this. Indeed all seeds will germinate quicker, and with more certainty, if covered with something that will maintain the thin stratum of soil which immediately surrounds them in an even state of moisture. But the covering should be removed the moment the little embryo plants show signs of growth, and from this time forward they should occupy a light position, though not necessarily in the full blaze of the sun, as such a situation is unsuitable for tender things. When large enough to handle, prick off, and when established a close frame on a bed of ashes in some open situation will suit them; but as the sun waxes warmer in summer, a position screened from its fiercest rays will be necessary, or the leaves will lose colour. All the *Primula* family, no matter what country they come from, have a fondness for shade in hot weather. After June the lights may be removed altogether, except during heavy rains, and the plants should be shifted into larger pots as they require it. The soil should be light, but not too rich—loam, leaf-mould, and peat in equal parts, with sand and charcoal to open it, will suit all the family. It is not advantageous to give too large shifts, as good-sized plants may be grown in 6-inch pots. Never permit the plants to become pot-bound till they occupy their blooming pots, whatever sizes these may be. All plants when pinched at the root have a tendency to burst into flower, and in this case such flowering would be premature, as such plants never reach the same perfect development as if grown steadily on till the flowering point is attained in natural course. In October the plants should be moved to a warm greenhouse to

flower, and must occupy a light position. Every time, all through the season, the watering must be carefully done, for if damp lodges about the plants, especially at the base of the leaves, decay often sets in, the plants sustain injury, and sometimes death ensues. But this tendency to decay at the bottom of the leaves is very often caused by bad management early in life. In the first place, the seeds are sown too thickly, and when germination takes place the little seedlings are left too long, drawing each other up in a weakly condition in the seed-pots, and, as a consequence, the little plants have legs abnormally long, and these long legs are a great source of trouble afterwards, very often leading to deep potting to get rid of them, and as often rendering sticks necessary to keep them steady. All this might have been avoided if the seeds had been sown thinly, and the plants grown on in a light position unchecked.

SEEDS.—A few of the finest plants bearing the best and brightest flowers should be placed on a shelf in a light dry situation to produce seeds. I like to select the seed-bearers from the latest-sown batch which flower in spring. The flowers should be daily gone over with the camel-hair pencil when they are dry. Unless this be diligently followed up the crop of seeds will be small. By saving seeds from the best flowers only, a good strain will in course of time be originated, which will annually become more valuable. It is best to raise young plants annually and discard the old ones, as the young plants are best and carry the best foliage.

DOUBLE PRIMULAS.—These are very beautiful, and are also very valuable for cutting. Some of the newer forms have large flowers, the single pips of which, when wired, are useful for bouquet making. The double forms require much the same treatment as the single kinds, only, of course, they must be rooted from cuttings or by division of the root stock in spring, whereby it will often happen that pieces can be detached with roots attached. The division for the purposes of propagation is usually best effected in spring after the principal flowering is over. Old plants may be cut into as many pieces as they have shoots or crowns, and each should be put into a small pot filled firmly with very sandy peat, afterwards placing the pots in a nice steady bottom-heat of 70° or so. They must be kept as close as is consistent with an absence of damping, which must be guarded against. But under favourable circumstances there is no difficulty in working up a stock, and there are no plants more useful for winter work. In dividing the plants in spring a few of the healthiest and best may be potted on as they are, to form specimens and show what the double *Primula* is capable of when grown in a light house near the

glass, but shaded from bright sunshine. They should be potted in porous soil, such as rough nodules of loam and peat, with plenty of sand intermixed. With the watering entrusted to an experienced and careful hand, the double *Primula* will give very valuable results. In winter the plants should occupy a house where the temperature never falls much under 50°. By taking the cuttings early in spring, nice blooming plants will be obtained by autumn. During the summer a cold frame is the best place for them, but they should be housed in good time.

The Chrysanthemum.—This forms one of the chief attractions of the cool conservatory in autumn and winter. Though they are easily grown, yet to produce handsome specimens clothed to the base with healthy foliage requires skill and much patient attention. Some kinds carry their foliage much better than others, and when these varieties are discovered it is well to allow such to predominate in the collection, as good healthy foliage adds much to their effectiveness, and the want of it is such a great drawback. If *Chrysanthemums* are expected to attain their highest point of excellence as specimen plants, the cuttings should be started in November, and none but those in robust health should be selected. Plant singly in small pots, and plunge in Cocoa-fibre, or some similar material, in an old hotbed, where there is just sufficient heat to help forward the steady production of healthy roots, but not enough to excite undue growth. In this position the young plants may be kept through the winter just slightly on the move, receiving plenty of air in suitable weather, and protected with warm coverings during severe frosts, using covering enough to keep out the frost, so that they at least may be partially, if not wholly, uncovered most days when the sun shines. Generally speaking, during frosty weather, turning back the coverings at the top to let in light will be sufficient. Some kinds of plants may be covered up and kept in darkness for several weeks at a time in winter without injury, but I do not think the *Chrysanthemums* belong to the number, nor is there any necessity to expose them to such an ordeal. The great object should be steady vigorous growth, to ensure a strong sturdy base, with plenty of healthy roots, and this is best accomplished by giving plenty of time; hence the value of autumn propagation, though at the same time it must be conceded that spring propagation also produces good results, especially in the production of plants for home decoration. Following the fortunes of the autumn cuttings, by the end of February or beginning of March they will be in nice condition for pushing on with the increasing daylight. But all through their career they must not be permitted to get pot-bound till they are

in their flowering pots. Neither is it wise to give large shifts, as this causes gross growth, which proves troublesome to keep within bounds. The leading shoots should be pinched at the right time, to keep the plants well furnished and bushy. The stopping and potting should not be done at the same time, as, on the principle of minimising the checks, it is best to do the pinching a short time (long enough to allow the buds to burst) before the potting. The last stopping should be given not later than the middle of July, and the last shift not later than the 25th of that month.

SUMMER MANAGEMENT.—The plants must have plenty of room. When placed close together the leaves suffer and become a prey to mildew. They should never stand so close as to touch each other. All through the spring till the middle of May they should receive careful attention in watering, ventilation, etc., throwing off the lights in the daytime when fine; and when the weather becomes settled after the middle of May the plants should occupy a sheltered, though at the same time an open position, on a coal-ash bed in the open air, having previously for the last month or so had the lights drawn off them on every favourable opportunity. They should be arranged on the bed in lines, so that access can be obtained to every plant for the purpose of examination. During bright weather the foliage of the plants and the ashes beneath and around them should be sprinkled daily with soft water. On no account must this be neglected, as the health, vigour, and freedom from insects depends in a great measure upon this being done when necessary. Water at the roots, too, must be freely given, for *Chrysanthemums* are gross feeders. Provided the drainage is free and the compost used rough and fibry, it is not easy to over-water when the plants have become large and bushy. In very bright weather they will require water twice a day—morning and evening, with a sprinkling over the foliage about 3 o'clock in the afternoon in addition.

LIQUID MANURE must be frequently given when the buds are showing, and onwards, varying the kind of liquid used occasionally, as plants appreciate a change of diet sometimes. Soot-water is good for nearly all plants as a change. A little guano occasionally may also be given with the same object in view, as well as Standen's or any other of the artificials. Soot-water, when clear and weak, may be syringed over the foliage occasionally. It gives a fine dark glossy character to the leaves, and keeps back insects and mildew. It can be made by tying up a peck of soot in a bag and sinking it into a barrel of water, stirring it daily for a week. Then drop in a lump of lime (about a couple of pounds in weight)

to clarify it. In syringing, use 1 quart of the liquid to 3 gallons of soft water. It is a good wash for Roses, Azaleas, or any other plant that requires a wash. Prevention is better than cure; therefore use the wash in time and, in fact, for the sake of its health-giving properties.

TRAINING, ETC.—In order to show the blossoms to the best advantage, it is necessary to afford them support; but the stakes should be neat, and not placed conspicuously. The training should take place early, so that both flowers and foliage may appear in their natural condition, which they rarely do if the plants are left too long untrained. To obtain fine flowers the buds must be thinned, but not immoderately, for home use, leaving, of course, those which furnish evidence of their fitness to survive, and after a little experience these can soon be identified. The plants should be placed under shelter of some kind before severe frost arrives. A glass roof is best, but I have often kept them securely under a temporary canvas screen that could be rolled up in the daytime and let down at night. The best compost for Chrysanthemums is a good holding loam full of fibre, especially for the last shift. It may also for this shift contain more nutriment in the shape of manure. In the earlier pottings, leaf-mould or very old hotbed manure to the extent of one-third should be added to the loam. Calcined oyster-shells may be advantageously mixed with the soil, as they will not only keep the soil open, but add to its stimulating constituents. Bone-dust in small quantities can also be used with benefit, and when the loam is light and sandy, clay may be mixed with it, first drying it and then breaking it up into a fine dust with a hammer, in which condition it at once blends thoroughly with the loam. I found a great advantage years ago in using clay when I cultivated a poor hungry soil. Another valuable stimulant, too, for Chrysanthemums, Strawberries, etc., was night-soil, laid up until it got mellow and then mixed with the soil. For growing various plants which require high feeding, its effect was very marked; in fact, since using it I have entertained a very high opinion of night-soil as a fertiliser.

VARIETIES—*Large-flowered sections; Reflexed and Incurved.*—Dr. Sharpe, King of Crimson, George Glenny, Chevalier Domage, Progne, Venus, Christine, Prince of Wales, Mrs. Rundle, Princess Beatrice, Empress of India, Queen of England, White Globe, White Venus, Mr. Gladstone, Jardin des Plantes, C. E. Waters, Mrs. Haliburton, Mrs. Heale, Hero of Stoke-Newington, Alfred Salter, Mrs. Forsyth, Golden Beverley, Lord Derby, Purple King, Lady Hardinge, Lady Talfourd, Pink Perfection, Refulgence, Le Grand, Mrs. Shipman, Mr. Bunn, Duchess of Manchester, General Bain-

brigge, Her Majesty, Guernsey Nugget, Garibaldi, Emperor of China, and Hetty Barker.

Pompones.—These are indispensable for decoration both in the border and for pot culture for the greenhouse or window. Very neat little plants may be obtained for the latter purpose by striking the cuttings as late as May, and growing several plants in a pot, or by layering the points of the shoots still later. Prince Victor, Antonius, Jersey Gem, Golden Madame Marthé, Model of Perfection, Cedo Nulli in various colours, Sunset, Crimson Perfection, La Vogue, Bob, Fairy, Rosy d'Amour, Little Beauty, General Canrobert, Mrs. Dix, Adonis, and Surprise.

Anemone-flowered Varieties.—Mrs. Astie, Miss Nightingale, Perle, Astrea, Marie Stuart, President Morel, Aglaia, Astarte, Antonius, Rose Marguerite, Regulus, Firefly, Grace Darling, Reine des Anemones, and Virginale. This is one of the most beautiful sections of *Chrysanthemums*, and useful as cut flowers.

Japanese Varieties.—Comte de Morny, grandiflorum, Peter the Great, Madame Berther Rendatler, Dr. Masters, Bismarck, Fulton, Bend d'Or, Elaine, Mons. Lemoine, Thunberg, Yellow Dragon, Lord Beaconsfield, Reine des Beautés, Chang, Nagasaki, James Salter, Viceroy of Egypt, Red Gauntlet, La Frisure, Bouquet Fait, La Nympe, The Daimio, Duchess of Connaught, Fair Maid of Guernsey, Ethel, Alba-plena, Meg Merrilies, Lady Selborne, The Cossack, and Wizard. The Japanese section are very beautiful for cutting to fill vases, etc.

Chrysanthemum frutescens and Varieties.—These are popularly termed Paris Daisies, from their single Daisy-like flowers, and a most distinct and useful class they are for the greenhouse, conservatory, or border. Indeed the same plants after flowering all summer in the border, if not crowded too much, may be lifted towards the end of September, potted carefully, and placed in a close house for a time. They may be relied on to continue blooming till Christmas in a light position with just a little warmth; and after resting a few weeks, will begin again and continue to put forth crop after crop of flowers till the end of the year. Young shoots strike freely in spring in a gentle bottom-heat, like an ordinary bedding plant, and in summer under a handlight or in a frame kept close.

CHAPTER IX

Petunias, Double and Single.—Both classes are very suitable for pot culture in the greenhouse. About the end of January

place a plant or two of each kind in a temperature of 55° or 60° , having previously cut back any straggling shoots to make the plants more compact, and to induce the production of a number of young soft shoots, suitable for cuttings. When these are 2 inches long take them off, cutting smoothly, just beneath a joint, removing the bottom leaves; insert the cuttings in pots of sandy soil, plunging the pots in a hotbed having a temperature of about 80° . The best and quickest way to obtain good plants for pot culture is to dibble the cuttings singly into $2\frac{1}{2}$ -inch pots, as when rooted they can be potted on without any derangement of roots, and the fewer checks a plant receives the better. As the young plants progress, they should be moved into a house and be placed on a shelf in the full light, near the glass, and be shifted on into larger pots as required, not over-potting, nor yet permitting them to become pot-bound till they receive their final shift. Very nice specimens can be grown in 8-inch pots, and by starting early in the season they should have received their last shift by the end of May. During the growing season, when the plants are young, frequent attention must be given to lay a good foundation by stopping the young growth before too much progress is made. The right method of pinching is to do it when the removal of the terminal bud will suffice. If an inch or two of the shoot is taken off, there must be a great waste of force. Petunias cannot be grown successfully without support; therefore, as soon as the plants begin to make progress upward, a few neat stakes, sufficient to meet their needs, should be used to keep the shoots from splintering off, which they will do if neglected. As soon as the flowers show, diluted liquid manure may be given two or three times a week. All through their lives Petunias must have a light position; they are sun-loving plants, and when grown near the glass the flowers come brighter. The pots should be well drained, as the plants will take a good deal of liquid nourishment when in full growth and flowering. To obtain very large specimens the cuttings should be taken in August, kept moving near the glass all winter, and pushed on in a light position in spring. They are not particular as to soil. Fibry loam in a mellow condition, rather inclined to be sandy, enriched with leaf-mould or old hotbed manure to the extent of a third part, will do them well.

To raise new varieties recourse must be had to seed, and the more carefully the flowers are hybridised and selected, the higher the character and quality of the progeny will be. Selection alone, without the trouble of hybridising, will do much to improve the Petunia. Obtain a packet of seed from a good source, and sow it in heat in March, prick off the seedlings into pans or boxes,

afterwards giving each plant a pot to itself, and then wait for the flowers to come. As each flower opens we can judge as to its merits, and either keep or discard it as we wish. By following up this system of selection for a few years, a good and improved strain will be the result. Petunia seeds are very small, and should only be covered lightly; but good seed germinates with the greatest certainty in a slight hotbed in March, or on a greenhouse shelf with a square of glass over the pot. It often happens that the smallest, weakest plants among a batch of Petunia seedlings produce the best flowers, as the stronger plants are frequently coarse in habit, with that absence of refinement which breed gives in flowers as in all other things. Therefore, if the weaklings are discarded a great mistake will be made.

Varieties of Double Petunia.—Crimson King, Antagonist, Miria, Alice, Adonis, Beauty of Plymouth, Mont Tycho, Hibernia, Miss Hender, Lord Chamberlain, Marguerite, Talisman.

Single Petunias.—Elegance, Camell's Favourite, Mrs. S. Hibberd, Regularity, Dr. Denny, Beauty, Avalanche, Clairvoyant, Mrs. A. Maye, Annie Mann, Mrs. H. Cannell.

Tree Carnations.—These are so sweet and beautiful in winter, especially for cutting, as to be quite indispensable. They are easily grown too; a loamy soil, enriched with old cow-dung, and sharpened with road grit, suits them well. In order to procure abundance of flowers, propagate plenty of plants annually, and plant them out in a bed of loam, lifting and potting in September. Thus a lot of young plants will always be coming on. The older plants may also be turned out into the bed of loam for two or three months in summer with advantage. This causes numerous shoots to break away, and to obtain plenty of flowers there must be a free growth. Cuttings or pipings put in early in spring, if well attended to, will make nice blooming plants by the following winter. The points of the leading shoots, or even the side shoots, will make good cuttings, and, if inserted in pots of sandy soil plunged in a mild bottom-heat any time during spring, will quickly root, when they should be potted off and grown in a close frame for a time. Cuttings will also root under a handlight, or in a frame, any time during summer and autumn in a shady spot with more certainty even than in heat in spring. And such productions, with the longer season of growth which the early start gives them, make grand plants the following year. Tree Carnations are easily raised from seeds, and with a good strain the number of single or worthless flowers is very small. I saw lately a batch of seedlings, raised from a packet of seeds purchased from a London house, which contained superb flowers in a dozen different

shades of colour between crimson, white, and yellow, their value for cutting being very great, the cost of the seeds being repaid many times over by the value of the cut flowers. *La Belle*, *Prince of Wales*, *Exquisite*, *White Swan*, *Prince of Orange*, *Irona*, *La Favori*, *Covent Garden Scarlet*, *Souvenir de la Malmaison*, *Duke of Wellington*, *Proserpine*, *Princess Christian*, *Favourite*, and *Miss Jolliffe* are good varieties. Some of the best growers, such as *La Belle*, for instance, are quite at home trained on a wall in a light house; they flower freely in such a position—becoming, in fact, valuable climbing plants.

CHAPTER X

Greenhouse Annuals—**THE BALSAM**.—A mistake is made in sowing these too early, before other things, of which such numbers are now annually required, are sufficiently out of hand to permit of justice being done to them; and if such things as Balsams and Cockscombs are starved at the beginning, the Balsam at least never gets over it. If sown about the first or second week in April, pricked off when large enough to handle, and grown on close to the glass, nice bushy plants will be obtained. In the early life of the plant it is important that a good foundation be laid, which can only be done by keeping them in a light position near the glass. If the pots are partially plunged in a mild hotbed, so that the foliage is near the glass, a strong sturdy base will be formed, which may afterwards by high feeding be converted into very fine specimens. They must never be permitted to become pot-bound till they are required to flower, and all the first flower buds should be picked off. 11-inch pots will suffice for good-sized specimens, as they will take very large and strong doses of liquid manure. Abundant ventilation is necessary at all times, but especially as they approach the flowering period. The syringe may be used beneficially on the afternoons of fine days.

In potting, at every fresh shift an effort should be made to sink the plants lower in the pots; this tends to dwarf the plants by burying the stems; it also adds to the root force, as the buried stems soon throw out roots, which spread rapidly and prove most useful. The soil should be rich, but not too light. As the roots want something substantial to lay hold of, good sound loam, rather adhesive, and old hotbed manure, about half of each, will grow them to perfection. To save seeds, gather the plants which are producing the best marked, the most distinct, and most perfectly-shaped flowers altogether at one end of the greenhouse. Usually

at the time Balsams are in flower there are plenty of agencies at work to cross-fertilise without taking the trouble to do it ourselves.

THE COCKSCOMB (*Celosia*) is not so much cultivated as formerly, though when of a good strain and well developed there can be no question as to its effectiveness. The chief difficulty is in securing seeds of a really good strain, as the highly-bred plants, which produce the largest, best-shaped combs, do not produce so many seeds as those of inferior quality and breed. The only thing a would-be-grower of Cockscombs can do is to start with the best strain he can get. By a constant and rigid selection of his stock and by saving his own seeds, he may hope in time to originate a good strain of his own, and will soon find a demand spring up for his seeds. This is the plan adopted by nearly all the best growers, and it is a system that may be followed with advantage in the case of every plant raised from seeds. The old-fashioned hotbed made of fermenting materials is the best medium for the production of superior combs. The genial warmth and the atmosphere impregnated with ammonia seem just to suit their requirements. The seeds should be sown in March or April, and placed in the hotbed near the glass. Germination soon begins in the case of these seeds, and the closer to the glass the young plants are kept after they show above the soil the better. Prick them off when large enough to handle singly in $2\frac{1}{2}$ -inch pots, and plunge again in the bed, as near the glass as possible, to keep them short of leg and strong. Some growers starve them in small pots to cause an early development of the comb, then select the best, and grow on rapidly. This may suit those who cannot depend upon their seeds being good, and have but limited space; but the best results are obtained by liberal treatment all through their existence. Good foliage cannot be had on the starving plan. The plants should continue in the hotbed till the combs are full grown, and then be taken to the greenhouse, where they will continue in perfection for a long time if no damp is permitted to lodge on them.

THE PYRAMIDAL COCKSCOMBS, with their long feathery flower spikes of different colours, are exceedingly ornamental; indeed, this race has in a very great measure superseded the old-fashioned Cockscomb, as surer results are obtained with less difficulty. Besides, there is a grace and beauty about the waving plumes of drooping yellow and crimson flowers that is absent from the stiff, awkward-looking, old-fashioned combs; and although strain or breed has here also some influence, yet there is less difficulty in securing seeds of a good strain. A hotbed is the best position for the young plants in all their stages, though it is not so indispen-

sable in this case as in the other section, as they will succeed in a genial temperature near the glass without bottom-heat. For succession, sow a few seeds at intervals from March to the middle of June. They may be had in small pots for room decoration, or they may, if grown in a stove temperature with abundance of heat, moisture, and pot room, be quickly formed into handsome specimens 5 feet or 6 feet high, perfect cones of waving colour. Each plant should have one stake in the centre, to which the main stem should be tied; but no other training will be necessary, as the plants look best when the feathery side shoots are permitted to fall over gracefully. The plants intended for winter blooming should not have a lower temperature than from 55° to 60° , as they soon die if placed in a cool house, but when they have warmth they continue growing and retain their freshness nearly all winter. The soil should be rich, but it must be porous, to allow the liberal supplies of water (which the plants will need) to pass freely away. Turfy loam, six months cut, mixed with an equal portion of leaf-mould, with sand and charcoal enough to keep it open, will grow them to perfection. Save seeds from the handsomest plants only.

MIGNONETTE.—Fill a number of 3-inch pots in April with light rich soil, and into a slight hollow made in the centre of the pot with the point of the finger drop four or five seeds, cover them lightly, and place the pots in some warm position under glass. When the young plants appear, remove all but the strongest, and grow on near the glass. Each plant will require a small stake to support it, to which its main stem should be tied regularly as it advances in growth. As fast as the roots occupy the soil, shift into larger pots. As the days lengthen, a deep, cool, rather damp pit will be the best place for them, giving plenty of ventilation. All flowers should be pinched off as they appear till the autumn, and the required shape should be given to the plants as they progress in growth. The pyramidal form is the most natural, and requires the least amount of training. Keep the main stem proceeding upwards, and allow the side shoots to spread out horizontally, pinching a strong shoot where necessary. The Standard form is acquired by leading up the central stem to the required height, and pinching all side shoots to within an inch of the stem till the requisite length of stem has been secured; then by pinching the leading shoots cause the upper buds to break strongly and form the bushy head. Very large-headed plants may require to be supported by a wire framework to prevent the shoots when large and weighted with blossom from breaking off. These elaborately-trained specimens, if not allowed to produce seed, will last more than one year, but neat young pyramidal plants of one season's

growth are the most satisfactory on the whole. When *Mignonette* is planted in a border of good soil in a conservatory and not allowed to produce seeds, the plants assume a perennial character and grow to a large size—become shrubs, in fact, with hard ligneous stems.

Another way of growing *Mignonette* for winter and spring blooming is to sow the seeds thinly in 6-inch pots early in August, placing the pots in a cool frame. The soil should be rammed firmly in the pots, and be kept just moist, the seeds being sown all over the surface and lightly covered. The soil should be two-thirds loam and one-third old manure; when the young plants are half an inch high, thin out the weakly ones, leaving about half a dozen at regular intervals about the pot. The plants should be placed in the greenhouse in October, and encouraged to grow by placing them on a shelf near the glass.

In addition to the annuals just named, there are others which are worth attention for pot culture in the greenhouse. *Browallia elata* bears a neat little light-blue flower, freely produced all over the plant, which rapidly forms neat dense bushes. Sow the seed in April, prick off and pot on till they occupy 6-inch pots, which will be found large enough to carry nice little specimens. Pinch in at first till a bushy habit has been induced. *Schizanthus retusus* and others are very useful when well done; they are best sown in autumn and grown on steadily through the winter, pushed on in spring till large plants are obtained, when their chaste beauty will be sure to please. Dwarf *Scabious* are very useful for pot culture, especially for late blooming. Sow in the spring, shift on in summer with all flowers pinched off, and place in a greenhouse temperature in October. The flowers are valuable for cutting.

PHLOX DRUMMONDI is well worthy of pot culture; put five or six plants in a 5-inch or 6-inch pot, pinched and staked to correct their tendency to straggle. The plants should not be starved and neglected when young. The Everlastings—*Rhodanthes*, *Acroclium*, and *Globe Amaranthus*—are all valuable when well done as pot plants, and are not difficult to grow. Sow in spring, in light rich soil, in a hotbed, and after they are pricked off return the pots to the bed again, standing them on the surface without plunging them near the glass. The large-flowered *Mimulus* are also useful as pot plants, but they dislike bright sunshine; shade and damp, in a cool situation, after they are fairly started, are the conditions under which they succeed best. Other annuals might be cited as adapted for pot culture; but as I do not want to make this treatise unnecessarily long, I shall only say that all the neatly-habited annuals may be so employed.

CHAPTER XI

Miscellaneous Greenhouse Plants.—To describe minutely the culture of every plant commonly grown in a greenhouse would occupy much space, and at the same time involve a good deal of useless repetition. In the preceding chapters I have endeavoured to treat somewhat fully most of the principal families of both hard and soft-wooded plants, but outside these are a vast number of beautiful plants, some of which are found—and deservedly so—in all gardens, and these we could hardly pass over without a brief notice. *Aponogeton distachyon*, a pretty free-flowering aquatic, bearing Hawthorn-scented flowers, can be grown in a pan of water in the greenhouse with the greatest perfection. Pot in loam and plunge the pot in the pan of water. I have seen it grown in an earthenware pan such as is commonly used in country places to hold milk. Keep the pan full of water by adding more as it evaporates.

ABUTILONS.—These have lately undergone considerable improvement, and the newer varieties are well worth looking after for pot culture. Among the best older kinds is *Boule de Neige*, the white flowers of which are valuable at all seasons. The whole family are easy to propagate and cultivate. Cuttings of the young shoots will strike freely in spring and summer in bottom-heat. At the latter season a close frame or handlight will suffice. The following are good varieties:—*Canary Bird*, *Anna Crozy*, *insigne*, *miniaturum*, *elegantissimum*, *Vesuvius*, *delicatum*, and *Yellow Prince*.

ERYTHRINA CRISTA-GALLI (Coral plant).—This is a very showy and useful old plant for summer blooming. Afterwards when the wood is ripe it may be cut back and the roots stored away under the stage out of the way, and kept nearly but not quite dry till the growth comes away again in spring. Soil—turfy loam enriched with old manure. May be planted in a group on the lawn or in the sub-tropical garden in summer.

KALOSANTHES.—A race of very showy plants bearing bright scarlet flowers, for the most part on the ends of stiff, erect, rather succulent shoots. Cuttings of the young shoots may be inserted in sandy soil in spring and summer in gentle heat, or in the summer they will succeed in the greenhouse or frame, but the spring is the best time to propagate. Pot off when rooted, and pinch back when necessary to form a base. After a bushy habit

has been formed, let the shoots grow up to ripen and perfect flowers. Cuttings rooted in spring, if grown freely during the summer, pinched occasionally to create a dense habit, and wintered on a shelf near the glass, should flower freely the following spring and summer. Sometimes, in order to create nice little specimens quickly, the cuttings are shifted on without being potted off. Turfy loam, with a third part of leaf-mould and some sand and charcoal, will make a suitable compost. The heads of bloom, being heavy, should have neat supports placed to them before the flowers open.

RICHARDIA ÆTHIOPICA is a most useful winter and spring flowering plant, with fine bold leaves; should be divided and planted out, where a good supply of water can be had, in rich soil in May. They are often planted in trenches, and in dry situations the plan is to be commended; should be lifted and potted in September. If the plants are well attended to, they may be grown always in pots, but should occupy an open situation all summer. I do not think it is advisable to keep these and similar things in the shade; they want sun to ripen their growth; let them at the same time have plenty of water. The *Richardia* is, in fact, an aquatic. I have had it planted out round the edge of a pond, where it grew and flowered abundantly, and the winter never injured it. Of course the water was deep enough to prevent the roots freezing. They are continually throwing off offsets, so there is no difficulty in working up a large stock.

EUPATORIUM ODORATUM and *E. riparium* are best for pots, and most useful for winter blooming. The flowers of *odoratum* are white and sweet-scented. They are borne in large clusters in profusion for several months in the dull season. Cuttings of the young shoots should be inserted in spring in bottom-heat. When the young plants are potted off, pinch freely to induce many shoots to burst forth and create a bushy habit. About the end of May, plant out in a warm sunny border, not in over-rich soil, following up the pinching till the end of July, all growth afterwards being left to form flowers. Lift and pot in September before frost comes. Keep in the shade for a few days, sprinkling often to keep up the foliage till the roots get into action. House in October. When the flowering is over, give less water for a time, then prune hard back and plant out again in May. *Eupatoriums* may undergo this process of cutting hard back and planting out for many years, until they become immense bushes, and are exceedingly valuable for winter flowers. The *Stevia* are a very fine use-

ful family for a cool greenhouse in autumn and early winter, and may be treated as recommended for Eupatoriums.

VERONICAS are very useful autumn plants, and so easily rooted and grown that more need not be said about them. They are valuable town plants. Blue Gem, Imperialis, Mdlle. Claudine Villarmoz, Crème et Violet, and Le Gloire de Lorraine are amongst the best. Cuttings rooted early in spring will make nice blooming plants by autumn if well cared for.

ROGIERA GRATISSIMA is a valuable plant for winter—so valuable, indeed, that duplicates should be obtained of it. To ensure a floriferous habit, get the growth made early by growing it in spring in an intermediate house, cool down and place in the open air for a month towards the end of July, taking under cover before the frost comes. It bears large panicles or clusters of rose or blush-coloured flowers, in appearance not unlike a Laurustine, but more refined in effect. Makes an excellent standard trained to a single stem 2 feet or 3 feet high. Pot in loam and peat of fibry nature.

LUCULIA GRATISSIMA is a very deserving plant, and although briefly noticed in the article on wall plants, for which purpose it is well adapted, it is also a grand plant for planting in a border as a central object. Its immense trusses of rose-coloured sweet-scented flowers will be a special feature for several months in winter. It should be pruned hard back when the flowering is over, as the plant has a tendency to become leggy without severe pruning. In peat and loam it does well, and requires abundance of water when growing and blossoming. Although it does not take kindly to pot culture, and is not very easy to propagate, good propagators succeed with young shoots taken off with a heel under a bell-glass, and it may easily be increased by layering.

HYDRANGEAS, when grown in pots, are exceedingly useful for greenhouse or room decoration. They are easily propagated; the young tips of the shoots are often rooted in small pots after the flower bud at the end of the shoot has been developed, and thus a little plant in a small pot may be made to produce a monster truss of flowers. Excellent bushes covered with flowers may be had in 6-inch pots. Rich loam suits them best, with a proportion of old manure, although they are not particular as to soil. Some growers aim to make the plants produce flowers with a blue tint, and to this end use peat impregnated with iron, or mix iron filings with the soil, or use water that contains iron in solution.

STATICES are useful and interesting plants, possessing this advantage, that the flowers may be cut and dried, and in that state are very useful, keeping their colour a long time. Cuttings

should be inserted in sandy loam in a warm close pit, or under a bell-glass in a warm greenhouse. When rooted pot off singly, keeping close for a time till established, then move to an airy greenhouse. Soil—equal parts of peat and loam, with some sand and crushed charcoal to ensure porosity. The pots must be well drained, as the plants require a good deal of water. All blossoms should be picked off plants intended for exhibition till the first week in February, as this ensures a good head of bloom when wanted. Holdfordi, Frosti, and profusa are good varieties.

SALVIAS.—The tender sages are among the most showy of autumn and winter plants for the greenhouse. For the most part good-sized plants may be obtained from cuttings in the same season, and therefore it is needless to save the old plants, except a sufficient stock to produce cuttings, which should be struck like Verbenas in March, potted off, and either shifted as they require more space, or else be planted out in the border in light sandy soil, occasionally pinching in the strong shoots and supplying them with water in dry hot weather if they seem to need it. In September lift carefully and pot, using as small pots as the plants can be conveniently put into, keeping them in the shade for a short time, and housing before the frost comes. The following are good varieties:—*Salvias* Pitcheri, splendens Bruanti, Bethelli, rutilans, coccinea, grandiflora, tricolor.

The plants I have thus briefly referred to may be regarded as representative types, and it will be difficult indeed to find any soft-wooded plants that will not submit to the treatment of some of the sections.

CHAPTER XII

The Rose House.—Few plants yield better results for painstaking culture beneath a glass roof than does the Rose. The time will come, I hope and trust, when every villa garden shall have its rosery under glass. In the suburbs of towns, where the Rose dwindles and dies in the open air, poisoned by the vitiated atmosphere, a fair amount of success may be obtained by building a house for their culture. And no matter how humble and primitive the structure may be, so long as the plants are sheltered from the impurities in the air, they will grow and flourish. I have seen good Roses growing in a turf pit, rudely constructed by a town amateur, where in the open air the Rose failed to grow; but

THE BEST KIND OF HOUSE to grow a succession of first-

class blossoms in is a span-roof, not too large, or too curtailed in scope, but high enough to allow a covering of Teas and Noisettes to be spread under the roof; yet at the same time the roof should be near enough to the plants in the centre bed to produce vigorous growth. A good size for a rosery under glass for a moderately-sized garden would be 30 feet to 36 feet long, 16 feet wide, and 9 feet high to the ridge. A well-made border, 3 feet wide, should run all round the sides next the wall, and a raised bed or pit should occupy the centre. The faster growing Teas and Noisettes should be planted close to the wall, and be allowed and encouraged to ramble over wires placed 6 inches or 8 inches beneath the roof, spanning the path at intervals of 6 feet or so. I would have iron arches formed of a single stout rod, on which should be trained the slower-growing Teas and hybrid Teas, whilst the bed or pit, which should be from 2 feet to 3 feet deep and filled with leaves, should contain a collection of Roses in pots. Such, then, should be

THE ARRANGEMENT OF THE HOUSE.—The pots should be plunged in the bed of leaves, which should be damp enough to ferment mildly. Any one who has grown Roses in pots plunged in a bed of leaves in a house or pit otherwise unheated, must have been struck by the vigorous growth and robust blossoms which this treatment never fails to produce, as well as the absence of insects, which are often such a nuisance on Roses in spring, especially if their wants are not promptly met. The soft genial atmosphere which is produced by a mildly fermenting bed of leaves has a marvellous effect upon the growth of the Rose, as in fact it has upon all vegetation.

THE SOIL FOR ROSES must not be too light. A mellow turfy loam, enriched with about a third of its bulk of decayed manure, is best. The best way to prepare it will be to cut the loam (the top 3 inches or 4 inches, including the turf, from an old meadow) early in September, if possible, and lay it in a ridge-shaped heap, with the manure placed with it in alternate layers. When prepared in this way the manure may be fresh, though it should be free from litter. The heap will ferment a little, and become blended and in fine condition for use in the course of three or four months. It will only then require chopping down with the spade to fit it for use. The border should have a layer of drainage in the bottom, and then be filled in 2 feet in thickness with the prepared compost; and when sufficiently settled the Roses may be planted, which, if turned out of pots, may be done at any season of the year. As regards the central bed in places where leaves cannot be obtained, it may perhaps be advisable to give up the

idea of a bed of fermenting materials, as manure alone would be unsafe to use. Cocoa-fibre as a plunging material has its advantages, especially as regards neatness in appearance and regularity of temperature and moisture. On no account should too many plants be crowded into the house, as the result will be disappointing.

ROSES IN POTS.—If the plants have to be purchased, select them not later than the first or second week in December. Have them home at once. Shorten their roots a little, and also shorten back their longest shoots—not to prune them finally, but just to relieve the heads a little. Pot them according to size in pots suitable for them, using drainage in the bottom, as we should do for Geraniums or such like plants. Then plunge the pots in a bed of leaves or litter in the open air, and if frost comes before the plants are moved into the house scatter a little long litter over the tops of the pots also.

Though the house may be unheated the first year,, yet it will be better if a 4-inch flow and return pipe are taken round the house to keep out severe frost, or the heating apparatus may, if desired, be employed to force the blooms on in spring, starting it gently about Christmas. During the time the plants in pots are plunged in the open air the roots will not be idle, as may be ascertained if we turn a plant out of its pot and examine its condition. Just previous to taking the plants in the house the pruning should be completed. In order to get a good base to build upon during the immediately succeeding and following summers, the plants should be cut rather hard back, cutting out all weakly growths, and shortening the main shoots to some 5 or 6 inches. If started gently, all the dormant eyes will break, and plenty of wood for future use will be obtained. Especially will this be the case if the leaf-bed can be had to plunge in. In buying the Roses it should be ascertained that all have been budded close to the ground. Careless budders sometimes, to save themselves from having to bend their backs so much, stick the buds in several inches from the ground. Such plants should be discarded, and none but those springing directly from the ground taken. These, when planted or potted, should have the stock, whether Brier or Mannetti, buried beneath the soil. This will ultimately place the plant on its own roots, as the base of the budded Rose when in contact with the soil will form roots. Through the growing season a moist genial atmosphere must be maintained, using the syringe daily (twice on fine days) over the foliage of the plants. The roots must be kept in a moist healthy condition, giving liquid manure when the blossom buds

show, to enable them to develop into large and handsome specimens. I have already referred to the necessity for the plants standing thinly. One handsome well-grown plant will give more satisfaction than a dozen drawn-up weakly things will do. No amount of cultural skill can produce handsome pot Roses unless they have plenty of space, *i.e.* the leaves of one plant must not touch those of its neighbour. The plants from the central bed may be moved to the open air in October, or earlier if required, and the exposure will have a resting and ripening tendency, and during the autumn a grand Chrysanthemum show may be had in the central bed. Roses and Chrysanthemums may in this way be linked with each other, as the latter will endure a smoky atmosphere better than the Rose, though Roses will take no harm in the autumn, when growth is completed, if they are housed again before the buds begin to move.

INSECTS AND DISEASES.—Roses are more easily kept clean under glass than in the open air. Fumigation with Tobacco will make short work of the flies. Mildew must be met, if it makes its appearance, with a dressing of sulphur, either in a dry or a liquid form. A genial atmosphere and healthy root action are the best antidotes for insect pests or for diseases of any kind.

The second year the potting should be done in autumn, using the same compost as has been previously recommended, giving the strong plants a liberal shift. The weakly ones, after being reduced, may perhaps go back into the same size again. The pruning should be less severe, as we want the plants to increase in size—to form, in fact, handsome specimens; and the strong flowering wood may be left in some cases a foot long, at the same time keeping the plant symmetrical and well balanced, for if the plant pushes upward too fast the base will become weak. As the plants grow, especially in succeeding years, a little training will be necessary, as the heavy flowers will require support to prevent them falling over and sustaining damage. A few neat light stakes will answer the purpose very well, but no more should be used than are needed, as sticks do not add to the charms of the Rose.

STANDARD ROSES IN POTS are longer lived than in open air, and if not too tall are very useful. Especially is it desirable to have a few standards for mixing with a collection of dwarfs. They take off the sameness, break up the monotony as it were, and add to the interest of the collection. At the beginning of this chapter there is a description of an ideal rose-house; but Roses may be grown successfully under any kind of glass roof, and I hope I have said nothing likely to deter any one fond of Roses from beginning

their culture even within the smoke radius, either planted in beds or altogether in pots under glass. Knowledge is acquired by practice, and there are many little matters which only experience can teach. Difficulties are strewn pretty freely in every path, but it is by surmounting them that the most valuable information is gained.

ROSES ON THEIR OWN ROOTS.—In forming a collection of Roses for culture under glass, it is best to buy the strongest and best-budded plants, selecting the most robust varieties for pot culture. In after years cuttings of the most suitable kinds will be rooted, and the collection may ultimately be got upon their own roots if it be so desired. A good deal may be said on both sides of the question, and I do not feel called upon to argue it out now. As regards

PRUNING POT ROSES, all shoots not strong enough to carry blossoms are, as a rule, best cut clean out, and the stronger shoots should be so regulated as to show a fair proportion all over the plants. Only in this way can well-balanced bushes be grown. The flowering wood should be shortened back in proportion to strength, and as plants under glass mature all their buds, there is no fear of cutting off all the blossoms, even if the shoots are shortened back considerably. In pruning Teas the same system of cutting away weak shoots should prevail; but as Teas are more excitable, and do not altogether cease growing, the shortening back should be to ripe wood, but no farther; and so long as there is space to fill, the leaders may be laid in unshortened.

VARIETIES.—I append a short list, from which, as a matter of course, it is inevitable that many good and suitable varieties are omitted:—

Tea Roses.—Adam, Anna Olivier, Belle Lyonnaise, Cheshunt Hybrid, Catherine Mermet, Devoniensis, Duchess of Edinburgh, Homère, Isabella Sprunt, Madame Falcot, Madame Bravy, Marie Van Houtte, Niphetos, Rubens, Moire, Safrano, Souvenir d'un Ami, and Gloire de Dijon.

Noisette Roses.—Celine Forestier, Lamarque, Jaune Desprez, La Biche, Miss Gray, Bouquet d'Or, Ophirie, and Solfaterre.

Hybrid Perpetuals.—Abel Carrière, Alfred Colomb, Anna de Diesbach, Annie Laxton, Baroness Rothschild, Beauty of Waltham, Captain Christy, Charles Lefebvre, Countess of Oxford, Dr Andry, Duc Descazes, Duchess of Bedford, Duchesse d'Orléans, Duchesse de Vallombrosa, Duke of Edinburgh, Emily Laxton, Emilie Hausburg, Étienne Levet, François Michelin, Glory of Waltham, Harrison Weir, John Hopper, La France, Hippolyte Jamain,

Louise Darzens, Louise Peyronny, Madame Alphonse Lavallee, Mdlle. Marie Finger, Marquise de Castellane, Monsieur E. Y. Teas, Mrs. Baker, Prince Camille de Rohan, A. K. Williams, and Jules Margottin. This list might be much extended, as any vigorous grower may be added to it.

Bourbon Roses.—Baronne Gonella, Emotion, Reine Victoria, Queen of the Bourbons, Souvenir de la Malmaison.

Moss Roses.—Madame Landean, Mr W. Paul Salet, Lanei, and Little Gem.

Indoor Ferneries.—In the construction and arrangement of an indoor fernery there is abundant scope for the exercise of taste and skill. No class of plants submit so readily to such a number of dissimilar conditions as Ferns, and the question of temperature has less significance in their case than in that of most plants. It is true that to grow some species care must be exercised, but many of the so-called stove Ferns will succeed in a warm greenhouse, and all the greenhouse species will flourish in a warm house. Even hardy Ferns will acquire a freshness of tint under glass which does not always belong to them in the open air. Most Ferns are considered to do best in a shady position. To a certain extent this is true, but I am convinced that more shade than is necessary is frequently given them, especially if we want any of the fronds for bouquet making or for mixing with flowers, or if we wish at any time to move the plants out of the house in which they grow, which most people do at some time or other if grown in pots. Fronds grown in the shade in a high temperature heavily laden with moisture are of no use for cutting, nor even are the plants grown under such conditions of any use for decorating rooms, for the least blast of cold air shrivels up the delicate pinnules almost immediately. In constructing a fernery we must first take into consideration what is our aim and object. If we want plants to be moved into the rooms, or fronds for cutting to mix with flowers, they must have plenty of light and as low a night temperature as is consistent with healthy growth. If, on the other hand, we simply want to enjoy the plants as they grow without thought of removal, then the natural system of arrangement is decidedly the best. In such a case pots and tubs may be dispensed with. The fernery should be as large and lofty as means will admit, for no fernery will contain a representative collection that does not include some of the Australian Tree Ferns, and these require a considerable amount of space upwards and laterally, for their fronds are far-reaching. In a natural fernery the outline of the beds and borders should have as picturesque a surface as can

be given in a limited space; winding paths will be formed of some sober-coloured material, cement being very appropriate. The Tree Ferns may be grouped in the gullies or indentations, and lower-growing species on the banks, which may be aided by naturally-arranged rockwork. This plan gives more head room for tall species, and brings small kinds more into prominence. Mosses and other creeping things will fill up bare space and cover all with a living natural growth. In making the borders drainage is essential, and it will add much to the interest of the house if a quiet pool can be introduced at the base of a mound of rock, down the face of which a tiny stream might ripple. There should be no bare walls visible; in some way they should be clothed with suitable vegetation. Virgin cork is sometimes used for this purpose, but its chief fault is lack of permanence. I have seen clinkers and large pieces of hard furnace coke covered with cement used with good effect, and there are creeping plants, such as *Ficus repens* and others, that will cover quickly any naked wall with living greenery, clinging to the stones in a natural manner without aid.

The culture of Ferns in pots is not attended with more difficulties than are found in the case of ordinary plants. If the fronds are required for cutting, which in most gardens some of them are, I have generally found that a proportion of loam in the compost gives strength and substance to them. Indeed some kinds do best altogether in loam; and for greenhouse Ferns, especially plants which are required to possess a good development for furnishing corridors, rooms, etc., and which must at the same time be grown in limited-sized pots, loam as turfy and fibry as it can be had is the best material for them. It may be lightened with peat or leaf-mould if too heavy, and sand and charcoal dust will be useful if it lacks porosity, for in no case must stagnant water linger in the soil. The pots must be clean and well drained, and the soil in a healthy condition when used. The ball of the plant must be neither wet nor dry. The best season to repot is in spring, just before or about the time when growth begins. At that season Ferns may be divided—may in fact be cut up into little bits and begin life afresh in the smallest of fragments, though in such cases a close, moist, shady place will be of great value in encouraging early root-action, without which some may perhaps perish. Though the general potting should be done in spring, yet young growing specimens may be shifted at any time during summer.

Ferns in baskets look well, and this is an excellent way of growing all the naturally trailing or drooping species; indeed all

Ferns will grow as well in baskets as in pots, but it may not be either convenient or expedient to have too many grown in that way. Still, a few to hang about the house will improve its appearance, and they are very useful to move into the dwelling-house for hanging up in the hall and corridors, etc., on particular occasions. The simpler the form of basket used the better, as, whatever kind is employed, none of it should be visible when the plant which it contains is full grown. We make our own baskets of different sizes to suit the different objects we have in view, due weight being given to the requirements of the plants. When the baskets are made at home the cost is very small, as wire is cheap, and a handy man, after a little practice, can make them on wet days, the only tools required being an implement to cut the wire, and a pair of pliers to bend it in the right direction. Two sizes of wire are used—one stout, to form the groundwork of the basket, and the other of lighter substance to bind all together; afterwards a coat of paint is given to preserve the wire from rust.

VARIETIES.—*Adiantum gracillimum*, *A. hispidulum*, *A. reniforme*, *A. Sanctæ Catharinæ*, *A. setulosum*, *A. venustum*, *Anemidictyon phyllitidis*, *Asplenium alatum*, *A. bulbiferum*, *A. caudatum*, *A. Colensoi*, *A. divaricatum*, *A. diversifolium*, *A. flaccidum*, *A. Fabianum*, *A. lucidum*, *A. laxum pumilum*, *A. Veitchianum*, *Cheilanthes elegans*, *C. farinosa*, *Cyrtomium falcatum*, *Davallia canariensis*, *D. elegans*, *D. polydactyla*, *D. Fijiensis major*, *D. Novæ-Zelandiæ*, *D. tenuifolia stricta*, *Didymochlæna truncatula*, *Doodia aspera multifida*, *Doryopteris palmata*, *Gleichenia, circinata glauca*, *G. flabellata*, *G. Mendeli*, *G. rupestris*, *Goniophlebium sepultum*, *Gymnogramma sulphurea*. The gold and silver Ferns require for the most part rather more heat, but I have grown the species above named in a low temperature. *Hymenophyllum cristatum*, *H. dilatatum*, *H. flexuosum*, *H. Tunbridgense*, *H. Wilsoni*, *Todea pellucida*, *T. superba*, *T. Wilkesiana*. The two last-named genera require a close shady situation to do them well. They are usually grown in a glass case or frame in the shade. *Lastrea aristata variegata*, *L. decomposita*, *Lomaria gibba crispa*, *L. falcata*, *Lygodium scandens* (climbing Fern), *Neottopteris australasica*, *N. nidus*, *Nephrodium molle corymbiferum*, *Nephrolepis davallioides furcans*, *N. exaltata*, *Onychium lucidum*, *Phlebodium aureum*, *Platynerium alaicorne*, *Platyloma falcata*, *P. rotundifolia*, *Polypodium effusum*, *P. pectinatum*, *Pteris argyræa*, *P. cretica albolineata*, *P. scaberula*, *P. serrulata cristata*, *P. tremula*, *P. longifolia*, *Woodsia Veitchi*, *Woodwardia radicans*, *W. r. cristata*, *Dicksonia antarctica*, *Cyathea dealbata*.

CLUB MOSSES.—*Selaginella apoda*, *S. argentea*, *S. chinensis*, *S.*

denticulata, *S. d. variegata*, *S. Douglassi*, *S. formosa*, *S. helvetica*, *S. japonica*, *S. Martensi*, *S. Schooti*, *S. stolonifera*, *S. viticulosa*, *S. Wildenovi*.

CHAPTER XIII

The Plant Stove.—Many of the beautiful old flowering stove-plants have disappeared to make room for foliage plants, in accordance with a prevailing fashion. Doubtless the fashion will change again, and the flowering plants will come into favour. There is hardly a more beautiful sight than a stove filled with flowering plants in winter, for without naming Orchids (which will be referred to separately) there are numbers of plants which, in a night temperature of 60° or 65°, will produce a brilliant display. The best kind of house for stove plants is a span or half-span roof, not too lofty, but otherwise it may be as roomy as means and circumstances will permit. If convenient, it may have a pit in the centre filled with tan or leaves; not that I wish to lay much stress on bottom-heat, but the genial atmosphere which is caused by fermenting materials, if the fermentation be in a mild form, is beneficial. The pots need not be plunged in the bed, or at least only so far as will steady them. Most of the best-flowering stove plants will succeed very well if grown on stages, and everything should be as near the glass as possible, for the ripening process so necessary for the production of flowers cannot be carried on without abundant light.

SOIL AND POTTING.—All stove plants will grow in peat and sand, but most of the soft rapidly-growing things will be improved by having a proportion of loam—a large proportion, I might have said. It steadies and builds them up more firmly; they flower better for it, and the more fibre the soil contains the better. Therefore both peat and loam should be used before the fibre decays—say within six or nine months after being placed in a heap. Wherever a good collection of plants is kept, and it is desired to maintain them at a proper standard, a good stock of both peat and loam must be laid in annually. It is very short-sighted policy to do this grudgingly, for they form the basis of all good plant-culture. The fibre in the soil has a beneficial mechanical action besides the food, which, in its slow decay, is supplied to the plants just as they need it. The soil, after the fibre has decayed, may be as rich, but the plants will not do so well in it. Everything in connection with plant growing must be clean and sweet; the pots, if not new, must be well cleaned with a hard brush; the drainage materials

must also be free from all impurities, and, if needful, they should also be washed. If there is any earthy or deleterious matter among the sand, washing will remove it. These are little things, but they have an important bearing upon successful work. The general potting of stove plants will take place in the spring, usually in February or March, as this is the time when most things begin to waken into new life. Young growing specimens will of course need shifting on during summer, but for the most part the repotting of large plants will take place in spring. Very many of the bright-flowered soft plants, such as the *Justicias*, *Poinsettias*, *Bouvardias*, etc., may be rooted from cuttings in spring and grown to a flowering size in one season; but the cream of stove-flowering plants—the *Allamandas*, the *Dipladenias*, the *Ixoras*, *Bougainvilleas*, *Clerodendrons*, *Francisceas*, *Gardenias*, and *Imantophyllums*—are things of slower growth, which, when they attain specimen size, are valuable; therefore every pains should be taken to keep them in health, because, when once a large specimen of either of the plants named above gets out of health, recovery is difficult. A common practice is to give these plants root warmth by plunging them in the tan bed. It is true that root warmth corresponding to the temperature applied to the branches is a necessity, but a plant standing on a stage in a heated house is relatively in a right condition for making healthy growth. I grant that bottom-heat gives a fillip to growth, in the same way as a stimulant in the morning may produce for a short time some extra rapidity in the movements of a man; but it results in no permanent good. The best-flowered *Allamandas*, *Dipladenias*, and *Clerodendrons* I ever saw were standing on a broad shelf over, but not touching, the hot-water pipes, the branches being trained to the wires under the roof. To this class of plant light is more essential than bottom-heat. In the potting, as far as possible, all exhausted soil should be removed; the drainage should be ample, to carry off surplus water; and the soil, which must be rough and fibrous, should be rammed in firmly. Any little pruning that may be necessary, such as cutting back unripe shoots, or thinning weakly ones to concentrate the strength upon fewer outlets, should now be done. The *Bougainvillea* should be spurred hard back; few people prune these enough, and that is the reason why the flowers are so thin. I have an old plant of *B. glabra* growing in a pit, and every spring, about February, after it has done blooming, I cut it back to the old thick branches, just as one would spur in a Vine. Immediately it bursts forth in the wildest luxuriance. Shoots 5 feet or 6 feet long are developed in a very short time; from these laterals spring, and both main shoots and laterals are in the

summer and autumn one mass of flowers. In pruning all this class of plants cut well into ripened wood. Expose the young shoots to all the light possible, by training near the glass without any shade, and there need be no fear as to blossoms.

ROOF CLIMBERS AND WALL PLANTS.—If the house is lofty enough, a few creepers may be permitted to trail over and about, but they must not be allowed to grow too dense, or the plants beneath will suffer; in point of fact, if we want to grow really first-class specimens, the roof climbers must be trained very thinly, but there may always be space found for one or two choice things, such as the scarlet Passion Flower (*Passiflora princeps*), *Stephanotis floribunda*, *Jasminum gracillimum*, *Thunbergia Harrisii*, *Pergularia odoratissima*, and one of the *Allamandas*. Handsome foliage may be had by planting *Cissus discolor* or *C. porphyrophylla*. Where the stove is a lean-to, the back wall should be covered with creeping plants, either planted out in a narrow border or else grown in pots. The former way is the best, as the plants, having more root room, attain a better development. I have seen the night-blooming *Cereus* (*C. grandiflora*) flower well trained near the glass on the back wall of a stove. *Bougainvillea glabra* flowers well at the top, or, if in a very light house, as low down as the wood ripens. *Rondeletia speciosa major* makes a good wall plant. The *Hibiscus*, in several forms, will cover a large space in a comparatively short time; the variegated variety, *Cooperi*, is a rapid grower when once fairly established, and has a chaste appearance; its large single crimson flowers, too, are showy. One or two of the *Ficuses*, such as *barbata* and *repens*, may be used to cover dark corners, and a very useful amount of bright colour, as well as blooms for cutting, may be obtained by planting *Euphorbia fulgens* in a warm house in a light rich border.

BASKET PLANTS.—These will find a place in some part of the house. If it be lofty, the baskets may hang over the path, for then the drip from them when watered will not injure anything beneath. Among other things that are useful for filling baskets may be named *Achimenes* (various); *Æschynanthus*, in several kinds, are handsome pendent plants of a permanent nature. *Agalmis*, *Staininea*, *Cissus discolor*, and *Epiphyllums* do well in baskets, and are easily kept in health. *Hoya bella* is a very elegant little basket plant, and should be grown in rough peat and watered carefully. The little elegant trailer, *Manettia bicolor*, does well in a basket, and its flowers are more numerous when in the full light. *Panicum variegatum* is a very desirable Indian Grass to have in quantity to drape the base of the baskets, using another plant to fill in the centre. The *Panicum* has a handsome drooping

variegated growth. *Russelia juncea* is an old plant with very elegant habit, and it succeeds well in a basket. The stove aquatics form an interesting addition to it, even when grown on a small scale. A very small tank at one end, or in a corner, will suffice for an interesting group of Water Lilies, of which *Nymphæas cærulea* (blue Water Lily), *cyanea*, *devoniana*, and *rubra* may be cited as suitable species. I have seen them successfully grown in a No. 1 pot placed in a corner of the stove, surrounded by a mound of rockwork covered with creepers. The holes in the bottom of the pot had been securely stopped; some rough loam and peat had been placed in the bottom, and the Lilies planted therein. The Sacred Bean (*Nelumbium speciosum*), the Lattice-leaved plant (*Ouvirandra fenestralis*), and other aquatics may be grown if there is space.

RESTING PLANTS.—Though there is no positive or total rest for anything in this world, there must be a partial cessation from active work to give the plant time to gather up its forces for a renewed effort. Thus the *Allamandas*, *Clerodendrons*, and all that class of plants, when exhausted from flowering, must be allowed to go to rest by withholding water and lowering the temperature. The *Eucharis*, *Gesneria*, *Gloxinia*, *Imantophyllum*, and others of a like nature, will not flower effectively if rest be withheld. It is true that the evergreen section must not be dried off in the same manner as is customary with those which cast off all their foliage and start anew from the base, but they must all have rest. Even those plants—such as the *Poinsettia*, *Euphorbia fulgens*, *Justicia*, *Scutellaria*, *Thyrsacanthus*, etc.—which can be grown into flowering size from cuttings in a few months, flower all the better for undergoing a resting process in a lower temperature after the growth is made, before the stimulus of extra warmth is applied to bring out their blossoms. This shows how much there is to learn about the life-history and habits of growth of every plant we cultivate, and how impossible it is to do more than generalise within my present limits.

WINTER FLOWERS.—Many stove plants flower naturally in winter; others can, by a little management, be made to flower at that season. Of late years the *Amaryllis* has undergone great improvement at the hands of the hybridist; the few species grown thirty years ago have branched out in all directions—breadth being added to the petals, and colours which were then unknown have been evolved by intercrossing and raising seedlings. But working up stock being rather a slow process, the prices will, in comparison with ordinary soft-wooded plants, for some time rule high. Still, all who can afford it should select the *Amaryllis* family, as they

are grand things in winter. After the growth is completed and the foliage begins to change colour, water should be gradually withheld till the leaves fall away, then they may remain comparatively dry till the new growth breaks up again. During the resting period the bulbs may all be grouped together in a dark corner, but not out of sight, nor forgotten or neglected. As soon as a movement is observed they must be repotted, if needful, and placed in a light position near the glass. Turfy loam, enriched with old manure and made fairly porous with sand, will suit them. Another bulbous plant that is now much cultivated is the *Eucharis amazonica*; but this being an evergreen, the drying process should not be carried too far, as the foliage must not be allowed to suffer. Of course any one can flower this plant now by a system of judicious checks, such as partial dryness, or by moving to a lower temperature for a few weeks. When it was first introduced, however, there was some difficulty in getting it to flower, and I remember I induced the first lot of full-grown bulbs to flower by shaking them out and repotting; but the resting plan is the better one. Two or three crops of flowers may be had in a season by this means from the same bulbs, when they are full grown in size. They also succeed well planted out in a narrow shallow border anywhere in the stove or a warm house. I have seen them succeed well on a narrow bed made up with boards near the hot-water pipes. In fact they will do very well wherever the warmth and moisture are well under control. The *Imantophyllums* are showy and valuable plants that will succeed well under a system of forcing and resting, but, being evergreen, the rest will include only partial dryness, accompanied by cool treatment. Begonias are useful winter bloomers for a cool stove, and when in flower may be moved to the conservatory. *Plumbago rosea*, a dwarf species easily propagated from cuttings in spring, is valuable from its distinct shade of colour. *Thyrsacanthus rutilans*, *Centropogon Lucyanum*, *Conoclinium ianthinum*, *Pentas carnea*, *Eranthemum pulchellum*, *Franciscea calycina major*, and others, are very showy, and when the wood of the latter is well ripened they flower freely. They should be moved into a greenhouse near the glass to ripen the wood in summer, and in warm seasons I have turned them out with the greenhouse plants in the open air. Plants so treated never fail to be covered with blossoms within a short time after being placed in heat again.

Epiphyllums in various colours grafted on the *Pereskia* stock, standard high, are very effective in winter. After the growth is completed in spring, let them pass the summer in the greenhouse, then a short time before flowers are wanted move a few at a time

into the stove. *Rondeletia speciosa* is an excellent stove shrub, nearly always in flower. It has maintained its hold upon cultivators all through the rage for foliage which set in twenty years ago. This list might be indefinitely prolonged did space permit, but I will only further notice the *Tabernæmontana coronaria* fl.-pl., and the *Gardenias*, which are so sweet and fragrant in winter and early spring. The former is valuable for cutting, and deserves more attention than it receives. The *Gardenia* everybody knows by sight at any rate, it being one of the most popular market flowers. Some growers make a specialty of it, and build houses where it can be planted out in beds of rough peat. Under this treatment it attains its most luxuriant development. The *Gardenia* may also be successfully grown in pots. Fibry peat and plenty of sand to keep it open are its chief necessities, with plenty of warmth and moisture during its growing and blossoming periods, and a thin shade to soften the rays of the sun in the middle of the day. After the growth is made, the temperature should be lowered to ripen the wood. If the plants are in pots they can be moved to a cooler house, and in the hot summer weather they will receive no harm if placed in the open air for two or three weeks during the brightest season. *Gloxinias* can easily be had in flower in winter, or at any other time, by inducing early rest. In this respect they are very manageable, and seem to fall naturally into any desired arrangement without loss of vigour. *Achimenes* may, by a system of starting in batches, be made to reach up to Christmas. These are very useful, and more ought to be done with them, as they are so well adapted for the small stove or conservatory. They must have heat to start them (a Cucumber frame or an ordinary hotbed will do), but when they have reached the blooming stage they will do very well in the conservatory. They may either be shaken out at starting, or started in the pots of the previous year, and potted off when an inch or two high; half a dozen plants in a 6-inch pot will make a nice little specimen, but a dozen in a 10-inch pan will make a grand one. The tops strike freely as cuttings, and dwarf miniature plants may be had in this way without much trouble. They also make excellent basket plants either for stove or conservatory. When the flowering ceases and the foliage becomes shabby, they may be dried off and stored away anywhere till the season comes round to start them again. Rough peat and leaf-mould, with plenty of sand, will grow them well. But for the amateur's stove in winter there is no class of flowers more useful than the *Gesnerias*, of which *Zebrina splendens* may be taken as the type. They succeed well in shallow pans, planted in rough peat, with a little leaf-mould and plenty of sand. A single tuber

in a 4½-inch pot, well grown, will make a nice little table plant, but they are very effective in large pans, 8 or 10 tubers in each. They should be rested when the growth ripens, in the same way as the *Achimenes*, to which family the *Gesneria* is nearly allied.

INSECTS.—In the stove, if neglected, insects increase at an alarming rate; thrips, green-fly, scale, and, above all, mealy bug, revel in its warmth, and suck the life-blood out of the plants, unless a war of extermination is waged. The mealy bug is the most difficult to deal with, and it has a greater liking for some plants than others. The *Stephanotis* and *Gardenias*, for instance, are its special favourites, and if the former of these is encouraged to spread over the roof, and the bug gains admission to the house, a very determined effort must be made to destroy it before it becomes numerous. The only real remedy is to persevere with the sponge and soft soap in winter, when it does not increase so fast. Various things have been recommended for syringing plants infested with bugs. Among other remedies paraffin oil has some value, but the difficulty with all things applied in this way is, that enough of insects will be left to fill up the ranks again rapidly. To get rid of them altogether they must be followed up into their secret haunts, where the water from the syringe cannot penetrate; and when once the enemy has been banished, great care should be exercised, when bringing in new plants, to see that they are obtained from a clean source—if it be possible. The green-fly and thrips can easily be destroyed by fumigations of Tobacco on several successive evenings during a damp time. The brown scale must be attacked in the same way as the bug—by washing with insecticides. A strong solution of soft soap, applied warm, will be as effective as most things. The scales cling close, and many require touching rather firmly with the sponge, or occasionally with a sharp-pointed stick, to dislodge them.

FINE-LEAVED OR TROPICAL PLANTS.—It is of course impossible to do more within the limits I have laid down for myself than just glance briefly at the many numerous families which are grouped under the above heading in plant catalogues. Of late years the chief groups, such as the *Crotons*, *Dracænas*, *Caladiums*, *Marantas*, etc., have grown into large dimensions from the many introductions from abroad, as well as hybrids raised at home. Whenever a demand arises for anything, busy minds and hands are soon at work to supply it; hence the growth in numbers of this class of plants, many of which are exceedingly beautiful. Their chief requirements are heat and moisture. Many of the most beautiful species are natives of the hot swamps of the Polynesian Islands, and the nearer the approach to such conditions in

our hothouses, the better the results. All through the growing season a night temperature of 70° will be necessary, and in order to colour them effectively the plants must be grown near the glass, as they will not put on the colour properly in the shade, nor yet if far from the glass. Crotons and Dracenas especially must have all the light possible to colour them well. Young plants may be grown best in peat and sand, but as they get larger and older, a few rough nodules of loam may be added, and I have seen them well grown in pure loam of very superior quality. Caladiums are commonly grown in peat, but the best collection of these I have ever seen were grown in loam, with a liberal allowance of old manure. When grown in light soil, the leaves lack the strength and substance which a more substantial diet never fails to give. Caladiums are often injured by drying too much in winter. If allowed to get too dry the plants decay and die when placed in heat again, unless they have been exceptionally well grown. A well-grown crown has more vitality than a badly-fed specimen, and consequently will endure treatment that would kill a plant whose growth had been less firmly built up. But under any circumstances Caladiums should never be allowed to get dust dry. As the leaves turn colour, water should be given less frequently to aid the ripening process. While they sink to rest they may be placed under the stage, to be looked at occasionally, and enough water given to keep them plump and fresh. Three or four times through the winter will probably suffice for this. As soon as growth begins in spring, they must be shaken out and repotted in clean pots and fresh compost, and from this time forward should occupy a light position, with only a very thin shade in bright weather in summer. If the plants are syringed, very great care should be exercised in using nothing but the purest rain water; their large, brilliant, glossy leaves are very susceptible, the least impurity spoiling their effectiveness, and plants that are much sponged never carry the highest finish. This remark applies more especially to Caladiums and Alocasias, though with all foliage plants the cleaner the conditions under which they are grown the better, if they are to arrive at the very pitch of perfection of leafage.

PROPAGATION OF STOVE PLANTS.—The tuberous and bulbous-rooted plants increase themselves by offsets, which can be taken off when the repotting is done—preferably in spring. A few genera, such as Gloxinias and Begonias, in the case of scarce kinds, may be increased by cuttings of leaves. Some, such as the Bouvardias, strike freely from root cuttings—that is, by taking off pieces of the thick fleshy roots a couple of inches long, and inserting them

in pots of light sandy soil, then plunging in bottom-heat. All the free-growing species may be readily and rapidly increased from cuttings of the branches, either of the young tips of the shoots, or, in the case of *Dracænas*, cutting the old stems into single eyes or buds, and plunging in a brisk bottom-heat to force dormant buds to start. Some are easily increased by dividing the root stock into as many pieces as there are crowns. Of these the *Anthuriums*, *Alocasias*, and *Caladiums* furnish familiar examples. But with heat and moisture the propagation of stove plants offers no more difficulty than is met with in working up a stock of bedding plants. There are a few subjects difficult to deal with. *Ipomæa Horsfalliæ* and *Combretum purpureum* are exceedingly difficult to strike from cuttings, but the former may easily be grafted on roots of a commoner species, and the latter can be layered.

VARIETIES.—The lists of stove plants which I give below have been purposely made short and select, suitable for a garden with only moderate stove accommodation.

Flowering Plants.—*Allamanda Hendersoni*, *A. grandiflora*, *Æchmea fulgens*, *Anthurium Schertzerianum*, *A. S. album*, *Aphelandra cristata*, *A. Roezli*, *Billbergia splendida*, *Centropogon Lucyanus*, *Clerodendron fallax*, *C. Balfourianum*, *Combretum purpureum*, *Conoclinium ianthinum*, *Dipladenia Brearleyana*, *D. boliviensis*, *Eranthemum pulchellum*, *Eucharis amazonica*, *Euphorbia jacquini-flora*, *Franciscea calycina major*, *F. Hopeana*, *Gardenia florida intermedia*, *G. radicans major*, *Hexacentris Mysorensis* (handsome climber), *Hibiscus brilliantissimus*, and others, *Hoya bella*, *H. carnosa* (useful climber), *Imantophyllum aurantiacum*, and others, *Impatiens Jerdoniæ*, *I. Sultani*, *Ixora coccinea superba*, *I. Colei*, *I. Prince of Orange*, *I. alba*, *I. crocata rutilans*, *Jasminum gracillimum*, excellent for cutting, planted in a bed of peat and loam, and trained near the glass; *Justicia speciosa*, *J. carnea*, *Libonia floribunda*, *Medinilla magnifica*, *Mussaenda frondosa*, *Pancratium fragrans*, *Pentas carnea*, *Plumbago rosea*, *Poinsettia pulcherrima*, *P. p. alba*, *Rivina humilis*, *Rondeletia speciosa major*, *Stephanotis floribunda*—a well-known fragrant white-flowered climber, *Tabernæmontana coronaria fl.-pl.*, *Thunbergia Harrisii* (handsome climber), *Thrysacanthus rutilans*, *Torenia asiatica*, *T. Fournieri*, *Vinca alba oculata*, *V. rosea*.

Fine-foliaged plants.—*Alocasia Jenningsi*, *A. metallica*, *A. Veitchi*, *A. macrorrhiza variegata*, *Ananassa sativa variegata*, *Anthurium magnificum*, *Aralia Veitchi gracillima*, *A. elegantissima*, *Bertolonia margaritacea*, *Caladiums in variety*, *Cissus discolor*, *C. porphyrophylla*, *Croton angustifolius*, *C. Earl of Derby*, *C. interruptus*, *C. latifolius maculatus*, *C. Prince of Wales*, *C. Johannis*,

and many others, *Cyanophyllum magnificum*, *Cycas revoluta*, *Cyperus alternifolius variegatus*, *Dracæna terminalis*, *D. t. alba*, *D. stricta*, *D. alba-marginata*, *Begonia rex*, etc.

Forcing Flowers.—A house where flowers are brought forward for the conservatory is one of the essentials of a well-appointed place, even though all things may be on a very moderate scale. As the forcing house will be chiefly in requisition in winter, it should be light, and at the same time capable of being economically heated. The best class of house for bringing on early flowers, or for general forcing, is a low structure partly sunk in the ground, with a hipped roof, *i.e.* a long light facing the south, and a short one on the north side. Such a house will give a maximum of warmth and light at a minimum of cost. The interior arrangement will depend upon its width. If narrow, the forcing bed should be in front, with a path along the back, and shelves against the back wall and wherever room can be found, as the most should be made of the space. If the house was 16 feet wide, the forcing pit might occupy the centre, with a path all round, and shelves back and front. Such a house would require six rows of 4-inch pipe to heat it economically. The forcing pit might be filled with leaves, tan, or Cocoa-fibre; or a stage, if desired, may take the place of the pit. The pit might be chambered and have two rows of pipes for bottom-heat. This would be cleaner than leaves or tan, and only fibre enough to plunge the pots in, or to stand them on if unplunged, will be required. All such houses should contain a tank inside, in which a supply of water should be kept.

PREPARING PLANTS FOR FORCING.—In forcing plants the preparatory work is the most important, and will consist in so treating the plant as to enable it to build up a strong healthy growth early in the season, and afterwards be exposed to the most favourable conditions for maturing the growth and ensuring a period of rest before the application of heat. If we apply the excitement of artificial warmth to a plant whilst the activity of the summer still lingers about it, we may obtain growth, but there will probably be a paucity of flowers, simply because the flowers were not there, the work of fixing not being completed; hence the necessity and value of preparation. In the majority of things forced for their flowers, the preparation can be carried on in the open air; and many plants, especially those with bulbous roots, are prepared in Holland. But with reference to those things forced which can be prepared at home, take the *Spiræa japonica*, one of the most popular forcing plants in existence. Our home-grown plants, if well cultivated, are equal to most of the foreign importations. Divide the roots and plant them out in a rich border for two years, and strong clumps

that will force easily may be had. The same treatment will apply to Lily of the Valley, *Dielytra spectabilis*, and the most useful forcing plants.

SHRUBS FOR FORCING.—Those that have been prepared by special ripening culture are more easily forced than if only just lifted from the nursery bed and potted a week or two before being placed in heat. There are some exceptions to this rule. The American plants, for instance, being fibrous rooted, can be lifted with balls, and will force very well when lifted from the bed and straightway moved into gentle warmth. The *Rhododendron* and *Azalea*, in all their forms, are invaluable for forcing, as are also the *Kalmia* and *Andromeda*. Many, I might say most, of the deciduous spring-flowering shrubs will bear forcing if the temperature is not too high—not more than 60° at night. The *Lilacs*, the *Thorns*, the *Deutzias*, *Forsythias*, *Laburnums*, *Honeysuckles*, *Tree Pæonies*, *Mock Orange* or *Philadelphus*, the double-flowering *Sloe*, *Prunus spinosa* fl.-pl., flowering *Currants* (*Ribes*), *Spiræa prunifolia* fl.-pl., *Weigela rosea*, and others; and for foliage the Japanese *Maples* are equal to many of the stove plants. The *Silver-leaved species*, *Acer Negundo variegatum*, forces very easily, and produces an exceedingly light and pleasant effect among dark-leaved plants when flowers are scarce. The newer Japanese *Maples* are also very desirable things to possess for pot culture in the conservatory. The best kind of preparation, if the plants are required for forcing early, is to buy strong young plants, pot them in suitably-sized pots, which will give a fair amount of space for a season's growth, then plunge them out in an open sunny situation, and keep them well supplied with water during the growing season. The next best plan is to plant them in a prepared bed, leaving space between them for the air and light to play freely among the foliage. In any case a mulching of short manure will be serviceable. I do not of course pretend to exhaust this subject. A book might be written upon forcing flowers alone if every detail in connection therewith was examined. Very many of our hardy border-flowers will bear heat. The common *Primrose* forces as well as the best of them, and looks far happier and brighter under glass in January than it does in the open air exposed to the keen blighting blast. *Daisies* will submit to pot culture, but are impatient of much heat. *Violets*, everybody knows, will repay protection. In short, any hardy plant which flowers naturally in spring may be potted and brought on gently under glass in a moderately-heated well-ventilated structure. Take the common garden annual (or biennial according to its season of sowing), *Borage*—what a showy plant it makes in a pot when pushed early into flower! *Solomon's Seal*, again, is

another common thing which in winter has a majestic effect as a clump in a pot in a prominent position. Early-sown Canterbury Bells potted up will flower early in spring in the greenhouse. And how sweet the Brompton Stocks are early in spring, when sown about the middle of July, potted up in autumn, and brought on under glass!

The Propagating House.—This may either be a low span-roofed pit sunk partly in the ground, or a lean-to in the same position. The best propagating house I ever had was a small low lean-to, but it was capable of turning out an immense number of plants. The bed to receive the cuttings rested on a wrought-iron water tank, which had a flow and return in connection with the boiler, and furnished a regular steady bottom-heat of a most genial character. The tank filled up all one side of the house; the other side was furnished with an unheated bed to receive the pots of cuttings, etc., as they were lifted from the striking bed, and to harden them for potting off or moving on to other houses. Sand or Cocoa-nut fibre may be used as plunging material. Sawdust is not a bad substitute if not too fresh. It should be obtained from hard woods, not deal, as that sometimes generates fungus. A little house of this character would not cost much, and it will be found cheaper in the end to have a shallow iron tank to supply bottom-heat than trust to cement, which, in some cases, I have known to produce endless trouble. When the propagating season is over, there are many uses to which such a house could be put. Where many plants of various kinds are required, propagation or grafting may go on all the year, or be used for raising choice seedlings. Though I recommend a small house heated by hot water, yet I by no means despise a hotbed on the old-fashioned principle of leaves and dung in a brick pit or under a two or three-light frame. In the spring such a bed will do almost anything if made large enough to keep up a steady heat of 75° to 80°. All the usual kind of bedding plants may be rapidly raised in it, as well as most of the soft-wooded occupants of the stove and greenhouse. Seeds of all kinds are rapidly germinated in its genial warmth. In short, a hotbed of the character described, possessing a steady bottom-heat, will do anything which genial warmth can do to arouse the vital principle in seed or cutting. I have referred to sawdust as an excellent plunging material. It is all this and more, for it is one of the very best mediums for quickly striking difficult subjects among stove plants of a ligneous or semi-woody character that I know of. All the *Dracænas*, *Crotons*, *Ficus elastica*, and such like plants, will strike quickly in warm

moist sawdust. I have often laid-in the cuttings in bundles, and when rooted taken them out and potted them.

ALL CUTTINGS should be potted as soon as the roots are formed, before they ramble off and get tightly embedded in the sawdust or whatever is within their reach. Such roots, on lifting up the cuttings, generally break off, and the plants have to begin work again; but if the cuttings are potted off when the little roots are about a quarter of an inch long they receive no check. In all cases the rooted cuttings must be placed in the hotbed till established in their pots. Last spring I had a number of large Tea Roses in pots which had been flowering all the winter, and which about March had pretty well shot their bolt. They were cut down and the branches made into cuttings, using up all the wood, both the soft shoots and also the harder better-ripened wood. The cuttings, when made, were planted thickly in a bed of warm moist sawdust. Some of the cuttings from the soft points died from damp, but I do not think one of the fairly firm and ripe shoots failed to grow. We had plants enough to fill a long border, and most of them flowered during the summer and all through the autumn; in fact I cut buds half expanded from *Homère* and *Souvenir d'un Ami* on Christmas day.

CHAPTER XIV

The Unheated Plant-House.—By the exercise of ingenuity, a very great deal may be done in a glasshouse without artificial heat. The larger the structure the less fluctuation in the temperature, but it would be easy to improvise some covering for small greenhouses whereby in winter the usual run of greenhouse plants may be kept in safety without the necessity of going out on a cold frosty night to attend to the greenhouse fire. I remember that nearly twenty years ago a friend of mine, Mr. H. Howlett, invented a system of covering houses in cold weather, to economise fuel and prevent the atmosphere on a cold night from being scorched and roasted by hot pipes and flues. If I remember rightly it was called the “*Louvre protector*,” and in the model exhibited was fixed on the roof outside the house. It was fashioned like a venetian blind with strips of zinc, only instead of drawing up and down, as the venetian blind does, the strips of zinc could be elevated at pleasure, so that they stood at right angles to the roof; or they could be dropped down flat, when they formed a continuous metal covering enclosing a body of air, several inches in depth, between the covering and the roof, and it is this

motionless body of air which on cold nights forms such a good protection. The invention in question was reported favourably on at the time, but I suppose Mr. Howlett did not meet with sufficient encouragement to induce him to persevere. I am convinced that, in this or some other form, the owners of small conservatories might save their plants in winter without the necessity for a fire. There are other ways of managing an unheated house so as to take a good deal from it without running much risk of losing the plants. Most of us know that plants growing in a border will bear more cold than if in spot and exposed. Merely plunging the pot has been known in severe straits of weather to save the life of the plant. Hence it seems to follow that in unheated conservatories the main feature should partake of some degree of permanency. Groups of *Camellias*, for instance, will always be a striking feature in such a house. There are

MANY JAPANESE PLANTS bearing variegated foliage which may be used freely to give tone and character to such a house. I contend that unless the main features can be kept healthy and thriving without skilled or with only ordinary care, the house cannot be a source of pleasure, for unhealthy plants are always an eyesore. Besides the plants named there are many others of striking aspect calculated to inspire interest,—from China, India, and the Australian colonies. Plants which are rather too tender to thrive generally in the open air will be quite at home in an unheated house. Among these are Palms and *Dracenas* from Australia, *Rhododendrons* from India. Indeed, with a little trouble and investigation, a house could be filled in a most interesting manner with a number of plants which occupy a sort of debatable ground between the tender and those hardy enough to withstand our climate in the open. Besides the plants which attain to some size, there are many little things among bulbs, exclusive of the Japanese Lilies, which would be a special feature; and if in addition there was a pit and a frame or two, many things in pots could be brought on to furnish any bare space. Pots of annuals and many other early-blooming spring flowers (*Wallflowers*, for instance), sheltered in a cold frame, will bloom very early; in fact, if sown early, they will blossom all the winter. *Brompton Stocks* may be grown in pots, or rather be potted up in autumn and wintered in a cold pit for spring blossoming. Neat little bushes of *Laurestines* are useful in winter, and also the early hardy *Daphne Mezereum*. I append a short list of plants suitable for culture in an unheated house, but many others may be added:—*Agapanthus*, white and blue; *Aralia Sieboldi*; *Azalea indica*, various; *Arundo Donax* variegata, *Aspidistra lurida* variegata, Bamboos,

various ; Cannas, various ; Camellias ; Clematis, various ; Coronilla glauca ; Dracenas, various ; *Dielytra spectabilis*, *Edwardsia grandiflora* ; Fuchsias, various ; *Farfugium grande*, Fan Palms ; Hydrangeas, various ; Jasminums, various ; Lapageria, white and red ; Myrtles, various ; *Mandevilla suaveolens*, Oleanders (*Neriums*), *Phormium tenax variegatum*, tree Carnations ; Lilies, various ; *Solanum jasminoides*, *Vallota purpurea*, *Lycopodium denticulatum*, *Rhododendron arborea*, and other Indian species. I have jotted down from memory the above list of plants that may be grown successfully in a cold house without artificial heat of any kind, and I am perfectly sure that a house of any description may be made most interesting by using a selection from the list given, though it may of course be much extended. I have already pointed out that plants growing in a border suffer less from changes of temperature—if they are exposed to excessive cold, for instance—than when cultivated in pots. Therefore, in winter at least, all pots should be plunged in the border or in beds of Cocoa-fibre.

PITS AND FRAMES.—These may now be had in many forms. Some of the modern little structures in wood, iron, and glass are very handy and cheap, and if mounted on turf banks with a sunk path down the centre, might be converted into very useful little plant-houses. They are always useful ; in winter they will shelter beds of Violets, bring on beds of Lily of the Valley, or cover choice bulbs or any other plants requiring protection. In summer, young stove and greenhouse plants, such as Poinsettias, Begonias, Justicias, Primulas, Cinerarias, etc., may be brought on and matured for blooming in winter. I shall have occasion to refer to the larger use that may be made of these structures when treating of fruit culture, so need not go further into the matter now beyond saying that every one with a back yard, even if they have no other outlet for gardening energy, should possess one of these handy frames, which are made now in immense numbers to suit every buyer. I was lately looking over the works of Messrs. Boulton and Paul, of Norwich, and was astonished at the immense trade which has grown up of late years in these and other horticultural requisites, showing how the love of gardening is spreading among all classes of the community, and how large industries have been created by simply catering for the devotees of horticulture.

The Retarding House.—No villa garden of the first class is complete without a house of this character. It should occupy a north aspect, and will of course be a lean-to. Besides its value for retarding plants for exhibition, many shade-loving plants may be grown in it in summer. Fuchsias, for instance, and many other

things, will retain their flowers much longer in the equable temperature of the north house than in the sunshine. Azaleas and many of the New Holland plants may have their season much prolonged by being kept cool in the spring in a house where the sun cannot reach them to excite the blossom buds. In fact, no exhibitor seeking distinction can do without a retarding house to make his early and late plants meet at the right time. All the family of Lilies succeed admirably in the north house in summer, their flowers lasting much longer away from the sun's exciting influence. But I need not refer to it at greater length, as the value of retarding houses will be easily understood by all plant-growers.

CHAPTER XV

Cool Orchids.—These may be divided into several classes, according to the conditions under which they grow naturally, and the countries whence they come. Thus the Mexican Orchids succeed in a low temperature, 45° to 50° being quite high enough at night in winter, with a rise of from 7° to 10° in the daytime from fire heat alone. But the Mexican Orchids require a drier atmosphere and a freer circulation of air than cool Orchids generally do—such, for instance, as those which inhabit the higher regions of Peru—and this involves the application of more artificial heat in order to warm the air introduced. Though there are hundreds of species of Orchids from Mexico and elsewhere belonging to the families of Epidendrum, Bletia, Dendrobium, Oncidium, Maxillaria, Lycaste, Odontoglossum, etc., that will flourish in a night temperature under 50° in winter, which is not much higher than a warm greenhouse temperature, yet there are Orchids with cooler taste still than these. The Peruvian Odontoglossums, many of the Oncidiums from the higher mountain ranges, and others of similar habit and capacity, only require in winter to be secured from frost. Even the day temperature need not exceed 50° if fire heat alone has to be used to produce it, for too much artificial heat desiccates the moisture and dries the atmosphere much. A low temperature laden with moisture at all times, winter and summer, day and night, is necessary to suit this class of Orchids. There will of course be fluctuations in the surrounding conditions, but nothing approaching forcing should ever be attempted, because it will surely lead to the plants becoming unhealthy. Sometimes one is anxious to push on a slow-growing plant, but an increase of temperature will certainly defeat the object in view. The supply of moisture

must be abundant and constant. The floor, the paths and stages, must be frequently deluged, and the syringe must be used freely at least twice a day in fine weather to supply the needs of the plants which hail from the higher mountain ranges of Peru. Shade, too, in spring and summer will be necessary to screen the plants from the drying influence of bright sunshine. A low temperature highly charged with moisture brings robust growth, which consolidates as it advances, and flowers abundantly without that starving, ripening period which seems so necessary in the case of the East India and other species from a dry climate. To be successful in the cultivation of any class of plants—indeed I might go farther and say any individual plant—one requires to know something of the conditions under which the plants flourish in their native homes. When a plant is found in a wild condition in any particular situation, we may conclude that through a long series of generations the work of fitting the one to the other has been going on, and that it has survived and flourished simply because it had the power of accommodating itself to its circumstances. But if that plant is taken from the home where it has wrought out a place for itself, and exposed to a new and different set of conditions, the probabilities are that it will perish; hence the need of studying carefully the conditions under which plants have been growing before we receive them—not that those conditions can be exactly imitated in all cases, but they should guide us, and form a base or platform on which we may work.

THE KIND OF ORCHID-HOUSE suitable for a beginner would be a low span-roofed structure partly sunk in the ground; it may be with a path down the middle and a bed or stage on each side. As the collection increases, and the first plants develop into large handsome specimens, a larger house will be required—that is, wide and roomy, though not too lofty for this class of Orchids. There are two great divisions of Orchids—one is called terrestrial—which are usually grown in pots; and the other, which are epiphytal, are fastened to blocks of wood and suspended, or else planted in baskets where the roots can revel among Sphagnum, broken crocks, charcoal, and chips of stone.

TERRESTRIAL ORCHIDS must have plenty of moisture, but there must on no account be any stagnation. The pots specially made for Orchids have plenty of openings for the escape of water, and are in addition half filled with broken crocks or bricks for drainage. On this, for the plant to grow in, will come rough fibry peat, specially selected, and Sphagnum—two parts of the former to one of the latter, varying the proportions in the case of certain species when necessary, as it will be occasionally. Charcoal in lumps

of various sizes may with advantage be mixed freely in the compost; and for stimulants dry horse-droppings, in very moderate proportions, may be used. In the case of this class of Orchids the pots need not be quite filled, but the centre should be raised a little by forming the compost into a mound. The material should not be rammed into the pots too firmly, as the roots need air; but as the material used is not very compressible, the pressure of the finger must be brought to bear in order to fix the plants securely, so that the roots can get a good grasp. Unhealthy plants may often be brought back to health by planting them in baskets. It often happens, either from having to use inferior peat, or some other cause, that the compost becomes too close and sour, and the roots perish. If all the dead roots are cut away and the plants placed among rough fibry material in baskets, vigorous health will come back quickly to them. Orchids doing well, or even apparently so, require to have their roots examined occasionally; and we cannot with safety allow a specimen Orchid to go like a specimen Azalea, when it gets into a full-sized pot without repotting. Most Orchids make a new annual root-growth. Many of the old roots die, and repotting is necessary for the purpose of cutting away dead roots, which, if left, might bring disease and decay among the new roots just forming.

EPIPHYTAL ORCHIDS dislike having their roots embedded in soil; most of them succeed best when fixed on a block and suspended near the glass. In some cases it will be an advantage to plunge the block in a pot filled with broken crocks, surfaced with Sphagnum. Though this broken porous material may seem to furnish nothing tangible for the roots to feed upon, yet a vapour is continually arising from it, which is a great assistance to them. Almost any hard wood will do for Orchid blocks. Teak is commonly employed, but Pear, Apple, Crab, Birch, or any wood that does not readily decay will do. Baskets are commonly made of Teak, though sometimes wire ones are used; but except in the case of the Stanhopeas, which send their flower spikes down through the soil, often projecting out through the bottom wood is decidedly best. Baskets are specially suitable for surface-rooting Orchids, which of course most of the Epiphytal species are. In the preparation of the materials for potting, great care must be exercised, for to no class of plants is cleanliness more essential. The Sphagnum should be chopped up to suit the plants and the purpose for which it is required. The layer on the surface of the pots or baskets should be chopped fine; it will then grow, and form a carpet of living green beneath the plants. Some growers think this living growth of Sphagnum adds to the well-doing of

the Orchids, as most certainly it adds to their appearance. All the drainage material must be washed, and none but the best-selected peat obtained. As most people will have to buy peats, I may as well say that the South of England (Kent and Surrey) kinds are considered the best, and are not very expensive. Sand is not much used by Orchid-growers, its tendency being to close up the pores of the soil and prevent the air from entering freely. This chapter on Orchids is, I know, of the most rudimentary character; but as the culture of this class of plants is spreading among the class of people for whom I am writing, they could not be passed over altogether. There is a great future before cool Orchids, when their proper treatment becomes better known. Their wants are exceedingly simple; most of the failures have arisen from too much fondling and unnecessary trouble. A plant that will grow in great clusters on a tree on the top of a high mountain will not bear stewing in a hothouse, nor the wasting and drying of a hot sun, or fierce currents of dry air, which drink all the life-blood out of it.

INSECTS.—In cool houses there is less trouble with insect pests, although it is necessary to be constantly on the watch. If any of the thrip species make their appearance, fumigate at once and frequently till the last insect has disappeared. Beetles and cockroaches will give trouble if they are present, so will slugs and snails; and they must be perseveringly sought out and destroyed. Perhaps the beetle family may be induced to take poison, but other modes of destruction should be persevered with at the same time. A disease technically known as “spot” sometimes attacks Orchids. It is generally the outcome of improper treatment of some kind; either the plants have been overheated, or the roots have been rotted off in sour soil, through being kept too long in the same pot without repotting. Wherever it appears in a collection, its eradication can only be effected by discovering and removing the cause, and treating the plant more rationally in future. Though Orchids will stand a good deal of ill-usage before succumbing, yet when once in bad health a long time is required to bring them round again. Hence the necessity for care and watchfulness.

TEMPERATURE.—The temperature for the cool house should be, in winter—night, 38° to 45° ; day, 45° to 50° : summer—night, 55° to 60° ; day, 60° to 75° . These are only given as approximations to what is required, for no hard and fast line should be laid down. Assuming that the year is divided into two periods of winter and summer, the winter season will begin about the middle of October and end about the middle of April. But in the Orchid

house the change of temperature should be gradual. Alter the change of seasons, the one merging into the other slowly, not abruptly ; thus the lowest point named in the night temperature will be applicable to the season when the thermometer falls to a low point outside in the open air ; but as the days lengthen and the nights become warmer in spring, the night temperature in the Orchid-house will gradually ascend till it merges into summer maximum, the same rule applying to the day temperature.

LIST OF COOL ORCHIDS.—*Aerides japonicum*, *Barkeria elegans*, *B. Lindleyana*, *Cattleya marginata*, *Cœlogyne cristata*, *Cypripedium insigne*, *C. villosum*, *Cymbidium eburneum*, *Dendrobium japonicum*, *D. speciosum*, *Disa grandiflora*, *Epidendrum biflorum*, *E. Cooperianum*, *E. macrochilum*, *E. macrochilum album*, *E. macrochilum roseum*, *E. floribundum*, *E. nutans*, *E. paniculatum*, *E. chrysostomum*, *Masdevallia amabilis*, *M. caudata*, *M. coccinea*, *M. Peristeria*, *M. rosea*, *M. ignea*, *M. maculata*, *M. nycterina*, *M. Veitchiana*, *M. triangularis*, *Maxillaria aromatica*, *M. grandiflora*, *M. cruenta*, *M. picta*, *Miltonia Clowesi*, *Hoemaria maculata*, *Habenaria flexuosa*, *Pleione humilis*, *Pleurothallis cordata*, *Odontoglossum crispum*, *O. c. Alexandræ*, *O. blandum*, *O. cirrhosum*, *O. constrictum*, *O. cordatum*, *O. cristatum*, *O. grande*, *O. gloriosum*, *O. densiflorum*, *O. Lindleyanum*, *O. hystrix*, *O. maculatum*, *O. nebulosum*, *O. Pescatorei*, *O. radiatum*, *O. Rossi majus*, *O. tripudians*, *O. triumphans*, *O. Uro-Skinneri*, *Oncidium aurosum*, *O. Barkeri*, *O. cucullatum*, *O. ansiferum*, *O. bifolium majus*, *O. hebereglossum*, *O. pictum*, *O. crispum*, *O. incurvum*, *O. rupestre*, *O. superbum*.

The above list might be much lengthened if it were desirable or necessary, for numerous Orchids will thrive in the coolest greenhouse. To go through the various classes of Orchids would be beside my present purpose. I will, however, first name a few species that may be grown successfully in a cool stove—say with a night temperature in winter of 55° to 60°—with the ordinary mixed collection of stove plants. *Calanthe vestita* and varieties, *Cœlogyne cristata*, *C. speciosa*, *C. Parishii*, *Cypripedium caudatum*, *C. insigne* and varieties, *C. venustum*, *Dendrobium nobile*, *D. chrysanthum*, *D. cucullatum*, *D. densiflorum*, *Phaius grandifolius*, *Stanhopea grandiflora*, *S. oculata*, *Zygopetalum Mackayi* and varieties, *Saccolabium Blumei*, *Oncidium flexuosum*, *O. Papilio*, *O. luridum*, *O. varicosum*, *Lælia anceps*, and *Lycaste Skinneri*.

PART III

CHAPTER I

FRUIT CULTURE

ALTHOUGH as regards the large commoner kinds of fruit, heavy crops are produced in favourable seasons, yet much of it, through bad cultivation and neglect, is of a very inferior character; and until the matter is intelligently taken up by all who have gardens, fruit culture will not receive the attention which so important an industry deserves. Old trees are left standing in orchards and gardens long after they cease to be profitable, and young trees are planted without due preparation being made, or are placed in positions unsuitable for them. All this points to lamentable carelessness or ignorance, or perhaps to a combination of circumstances, probably not the least influential being the unjust law which gives everything placed in the soil to the landlord. Again, much loss is incurred both in time and money through the planting of unsuitable varieties. Fruit trees have their proclivities, or at any rate they possess different degrees of adaptability and hardiness. This explains why some varieties succeed in one place and fail in others, and much judgment is required to select varieties for different soils and situations. The nurserymen's lists require weeding. There is a profitable trade to be done by any skilled propagator who would select about fifty of the best Apples, and a less number of Pears (Plums there is less difficulty about), and work up a large quantity on suitable stocks. The kinds will require to be selected with judgment, and must be those of a cosmopolitan nature, that have been proved to flourish pretty well in all situations. Lists will be given farther on which it is hoped will meet this requirement.

THE SELECTION OF A SITE FOR FRUIT GARDENS, if one has

any choice in the matter, is of great importance, as I have often observed orchards where, from various local causes, the trees had no chance of doing their best. A gentle declivity trending southwards forms the best position, or it may have a bearing to right or left of a full southern exposure. The top of a hill or plateau is not so good, because of the absence of shelter, which in fruit culture is all-important; neither is the base of a hill, nor the low ground in a valley, suitable; for though there we might find places sheltered from wind, yet the late spring frosts will destroy the blossoms and dispel the fruit-grower's hopes of profit. As regards shelter from cold winds, belts or clumps of trees at a safe distance are beneficial, and a good thick Thorn hedge closely by has special merits. Whoever plants orchards or fruit gardens must seriously consider this question. If shelter has to be improvised, which in many cases it will, the best and cheapest is living tree and shrub growth, and there is no reason why the shelter belts and groups should not assume an ornamental character suitable to the place. As I have already hinted, the thick Thorn hedge in the small garden will be a great help. In more extended places, where a space of some 20 feet or 30 feet or more in width can be spared on the windward side, a feature possessing both ornament and utility may be speedily created. One of the best trees for resisting sea winds is the Wych Elm. It is tough and pliable, grows rapidly, and bears pruning. Here then we have a tree which, for the most exposed situations, may be trusted to face anything in the way of wind. Fast-growing evergreens, such as Hollies, Laurels, Yews, Boxes, intermixed with Standard Thorns, a bright rosy-cheeked Apple, or a Laburnum to give elevation and variety, may form a serpentine belt, or be arranged in irregular groups at the will or pleasure of the planter, without formality or stiffness.

SOIL AND PREPARATORY WORK.—It is admitted on all hands that a loamy or, in other words, a mixed soil, is the best for fruit culture; and provided it is deep enough, the character of the sub-soil is perhaps of less importance. I may explain that loam is a mixture of clay and sand, is light or heavy according as one or the other predominates, and takes its character chiefly from the rock formation of the neighbourhood or district. In selecting the site of a garden, if we think of growing fruit largely, we should carefully examine the character of the soil, and especially its depth. For though, as regards a few wall or other pet trained-trees, the soil can be improved or made entirely, yet at the best the game is hardly worth the candle, and such trees call for incessant attention. I do not say that this attention may not be advantageously given where

needed, but I have often met with gardens badly chosen when as good a site and much better soil was close at hand, and might have been had. If it requires draining, that will be the first essential, and a good deal of money has been uselessly spent upon such work by laying down hard and fast lines as regards depth, without taking into consideration the nature of the soil. In springy land a few drains deep enough to tap the springs will be of more use than a larger number of equal depth. In draining it is necessary that a knowledge of the district should be acquired before much work is done or money spent by the engineer or whoever has the direction of the work. In any case the drains should be deep enough to escape the roots of the trees. Speaking generally, an average of 4 feet will be a suitable depth. Various materials have been used in the formation of drains in different districts, but there is nothing better than pipes or tiles of proportionate bore to the work required. When the pipes are well and truly laid with the proper inclination to the outfall, 6 inches of stones, if available, may be laid on the pipes before the earth is filled in. This is perhaps not absolutely necessary, but in wet districts it has much value.

CHAPTER II

The Orchard.—The definition of the term "Orchard," as generally understood now, is a collection of fruit trees (chiefly Apple) planted in parallel lines a certain distance apart. It is usually placed in the background in the neighbourhood of the kitchen garden, and laid down in Grass, the latter being fed off with sheep. In old times it is probable that the orchard was, more strictly speaking, a fruit garden, containing fruit trees of various kinds; and though I do not object to Apple trees anywhere, yet I cannot help thinking that the old idea of a fruit garden, where the Apple, Pear, Plum, Mulberry, Filbert, and all other kinds of hardy fruits, may be planted, is a pleasant thought, and more profitable withal than the orchard on Grass. In practice I have always found the modern orchard a wasteful system of fruit growing. In the first place, to do the trees justice the whole of the ground should be broken up deeply and the surface cultivated for a few years, till the trees are established. This, however, is seldom done, so the trees are started under difficulties; for simply digging a hole and thrusting a tree into it is only an enlarged system of pot culture; then these holes of loose soil in very wet times are apt to collect all the water near, and under its

chilling effect Moss begins to form. Again, the expense of protecting the fruit trees from sheep and cattle in their early stages is something considerable. Let a guard get out of order and be neglected only for a short time, and the sheep or cattle will find the unprotected tree, and of course the bark very probably will be peeled off all round the stem, and the tree will die. In after years, when the trees have struggled through all their difficulties and arrived at a profitable size, every Apple or other fruit which drops from the tree is eagerly snapped up and consumed by the living creatures waiting beneath. Of course the subject has another side, and many people like to see their homesteads embowered in fruit trees. But I wanted to show that when any given area can be set apart for fruit culture our present orchard system is not the best to adopt. At the same time, I would say, Plant Apples and Pears in every suitable locality. Plant on Grass if you like, or in hedgerows, especially those newly made, because the fences which protect the young quicks will save the fruit trees from injury. But in planting, whether it be a single tree or a group, have the ground thoroughly broken up and intermixed, though without disturbing the bad subsoil in the bottom, for at least a space of 6 feet in diameter, where each tree is to stand.

FRUIT TREES FOR ORNAMENT.—The planting of Apples and Pears within the precincts of the ornamental department is not a new idea, but rather a very old one resuscitated. There is more beauty in a well-grown Apple tree, for instance, than in many of the smaller trees planted as ornaments in the grounds attached to villa residences. It is true that the Apple smacks too much of the culinary department to become the vehicle of conveying poetic sentiment, such as clings to the Thorn, but the latter is not superior to the former in any particular. The prejudice against the planting of Apples near the house is disappearing, and nothing further need be said about it. To give fruit trees a chance in competition with other trees and shrubs, they should be planted at the same time, and this somewhat narrows our choice of site, as it would be only in new gardens where such facilities exist. But in the regulation of old shrubberies and pleasure grounds positions could easily be cleared for fruit trees, and a new and interesting feature introduced. The brightest-coloured varieties will give the most ornament. Blenheim Orange Apple, where it thrives, is a very handsome variety, and one of the best. Cox's Orange Pippin is another handsome kind. Fern's Pippin, again, is quite a picture, with its crimson-cheeked fruits, and seldom fails to bear. Of late kinds of Apples that may be recommended for planting in shrubberies, the Norfolk Beaufin will be found very

valuable, being a sure bearer, with highly-coloured fruit, especially in autumn.

THE IDEAL ORCHARD.—The shape it has assumed in my mind is a sheltered enclosure devoted entirely to fruit culture. It should be so fenced in and protected that even rabbits could not gain admission, or, at least (as I know how difficult it is to deal with them), if they once got in they might abandon all hope of getting out, and a little dog and a gun would soon make short work with them. In shape the orchard may be round, square, or oblong, as that is a matter of no importance. It might be laid out in blocks or beds for the convenience of planting, and the different kinds of trees grouped together. Thus, Apples in one place, Plums in another, Cherries in a third; then Pears, Nuts, and so on; and beneath all, forming the underground, would come bush fruits, Raspberries and Strawberries. Such a fruit orchard would be most interesting and profitable, and the last item will weigh with most planters, for a fruit garden which is not profitable must be a constant source of disappointment, no matter how much one may strive to keep up the interest. The different beds or quarters of fruit trees should be intersected by paths of some kind. I have seen Grass used with effect, and over the paths should be placed arches for training fruit trees on, such as Pears and Apples. A great deal of fine fruit may be grown on such arches. In their construction there is room for a good deal of ingenuity, and a mind possessing some originality will probably get off the beaten track. Wire arches for fruit trees are expensive, but there are other simpler and cheaper ways of covering a walk with bearing fruit-trees. The simplest form of all is to plant maiden trees 4 feet to 6 feet apart on each side of the path in pairs. Lead them up by training to a stout stake till they meet over the centre, then graft the two together, when they will soon prove self-supporting. In the course of time side shoots may be taken out horizontally, 1 foot apart, till they meet the branches of their opposite neighbours, when they also should be grafted together. It will take some little time to accomplish all this, but half a dozen years is not much in the life of a fruit tree, and the trees would be in bearing long before all this was completed. The vegetable garden, so far as regards all coarse things at least, would be better under a cheaper and simpler system of culture than obtains at present. I do not say that the land should not be well cultivated, but surface polish, which too often takes the place of good cultivation, need not monopolise so much time. If the fruit and vegetables were separated the latter would stand a chance of getting their full share of sunshine, and the fruit trees might grow in peace, with roots unmutilated by the

spade. The upper or top crop (referring again to the fruit garden) should be composed of tall standard Apples and Pears at not less than 25 feet apart; Plums and Cherries, at from 15 feet to 20 feet, according to kinds; whilst rows of Filberts and Nuts may intersect at suitable points. The bush fruits underneath should be planted in rows 6 feet apart, and be 5 feet asunder in the rows. The Raspberries and Black Currants should be planted where the land is moist and deep, and they do fairly well in more shade than suits other fruits. The shelter of the tall trees will benefit the bushes in cold springs, and the undergrowth will be of some advantage in checking the keen currents which would rush fiercely beneath the heads of the standard trees where no undergrowth exists. In this way the system is well-nigh perfect; in fact, in my humble opinion, there is no better or surer way of obtaining a good supply of fruit at the cheapest rate than that of the mixed garden or orchard. In the preparation of the ground, trench it up deeply in winter, when labour can be hired cheaply. In spring plant it with Potatoes to clean and free it from weeds, and the free use of the fork and hoe during the progress of the Potato crop will be of great advantage. In the autumn plant the trees as soon as the leaves fall. Some one who understands such matters should select them, to ensure healthy trees with straight stout stems. The Apples, being the hardiest, should be planted on the windward side; then might come a plantation of Pears, Plums, and Cherries. Positions will also be found for dwarf Apples on the Paradise, and Pears on the Quince, so that all systems of culture may be represented. It often happens that when the tall trees fail the dwarf ones nearer the ground are well cropped. This is the outcome of the fickle nature of our climate, which, in spite of all our efforts to screen and shelter, will make itself felt. It will be seen from what I have written that I advocate the giving up of the sheltered enclosures to the fruit, and moving the vegetables a little farther out, where, so far as regards the Potatoes at least, expensive manual labour will not be so much required. Whatever cheapens and simplifies gardening helps to spread its influence. In the following chapters I shall take our cultivated fruits in rotation, beginning with the Apple; and whilst giving all necessary details as regards culture, will yet be as brief as possible.

CHAPTER III

The Apple.—I hear from nurserymen of my acquaintance that the demand for fruit trees is increasing, and that not so much in

the shape of very large individual orders as in the increased number of small ones. Evidently the attention that has been given to fruit culture of late years by writers and speakers is being felt by those for whom it was intended, but only the fringe of the subject has yet been touched. As regards the Apple,

THE STANDARD FORM grafted on the Crab is undoubtedly the most profitable kind of tree to plant where the soil is deep and good, and the force of the wind can be broken. In the first place the labour required in management is not great. After the first season all the work required will be to look over the trees once a year, and remove where necessary any branch that may be encroaching upon a neighbour. Assuming that the trees are planted as soon as the leaves fall in autumn, they will need staking and mulching immediately. The roots will be at work before the buds move in spring, and as soon as the sap is on the move head the trees back to form a base cutting to within four or six buds, according to strength of branch. After the first year, unless the growth becomes very irregular, there should be no necessity to cut back. By planting early in autumn, and encouraging early root action, all the black eyes will burst in spring, and the foundation for a handsome tree may be easily laid. If it is intended to have a crop of any kind beneath the standard tree, the latter should have stems of not less than 6 feet high. Sometimes in windy places dwarf trees on the Crab or the free stock are planted and allowed the same freedom of growth as is given to the standards, and though they succeed well, there is not the same facility for planting any crop beneath. In shallow soils, where the stronger-rooted stocks will produce mischief by their natural inclination to run down,

APPLES GRAFTED ON THE PARADISE STOCK have very often been a great success, and where they have not the failure has been chiefly owing to a want of appreciation on the part of the cultivator. It should never be forgotten that a surface-rooting plant must find its food on the surface, and this must be supplied in the shape of mulching. Digging with the spade would be ruinous; but about March the loose mulch may be drawn off, and the crust just lightened up a little with a fork to let in the air to sweeten and pulverise the soil. When this has been done before the weather becomes hot and dry, the mulching should be replaced. For the production of really first-class fruit perhaps no system is superior to the

ESPALIER.—It is true the first cost is considerable, but if the wire and standards are strong, and the work well put up and painted as required, the cost, when spread over the period of its

duration, is not a great percentage. One of the advantages of the Espalier system of fruit culture is its adaptability for every situation. They may form a single row by the side of a path, or a whole quarter may be covered with them, their distances from each other being in proportion to their height. As a rule espaliers are too low. There is plenty of space upwards which virtually costs nothing, and no espaliers for Pears or Apples should be less than 5 feet in height. If a piece of land could be set apart for espaliers, and they were 5 feet high, the same distance should intervene, and they should run north and south to obtain the full benefit of the sunshine. The Apples on the Paradise never get much beyond a little bush, and therefore they do not require much space. To do them justice a border or bed should be set apart for them, planting them at first 3 feet apart. After the lapse of a few years the plantation will need rearranging, when those requiring it can be given more space. The chief thing to bear in mind is, that they are surface-rooting, and the roots must be fed with rich food in the shape of mulchings on the surface.

APPLES ON WALLS.—In the Midlands and the North, and in cold districts generally, a few of the best dessert Apples are sometimes with advantage planted against walls, to which they are trained in the same manner as Pears and Plums are; in point of fact, the Plum and the Cherry are as hardy as the Apple. The system of training may be a matter of convenience or personal liking; or we may be guided by the amount of space we have to cover, and the variety we wish to obtain from it. Both the Apple and the Pear submit readily to have their branches moulded into any shape. At the same time, perhaps, the simpler forms are best. The horizontal, for instance, is a very simple form, and whether we cover a wall or an espalier we plant trees at certain distances apart, say 14 feet, although the distance will vary somewhat according to the height of the wall or fence and the goodness of the soil, as in a superior fruit-soil the trees will naturally attain a larger development than is possible on an inferior one, no matter how much may be done to improve it. The Cordon and the Palmette are systems of training which in certain circumstances may be employed for the Apple; but as it will be necessary to speak more fully about these and other forms when treating of the Pear, I will not dwell upon them now. The Fan is the most ancient, and many still say the best form for fruit trees to assume. Certainly it has advantages, not the least being the ease with which a tree can be filled up with young wood, or by a rearrangement of the branches when a limb dies.

THE PROPAGATION OF THE APPLE.—Everybody ought to

know how to propagate so common a thing as an Apple tree. From the planting of the pip or seed till the tree is fit to take its place in the garden or orchard, as a fruit-bearing tree, is not so long. The seeds will of course be saved when the fruits are consumed, and if one has very choice fruits it may be interesting to sow the seeds with the view of testing the fruit which the trees from such seeds will produce. This is interesting work, and properly comes within the scope of the experimenting amateur. If the seeds are planted in pots they will be exposed to fewer vicissitudes, and when strong enough may be planted out. When as thick as one's finger—which in the case of the majority, under good culture, will be in three, or perhaps in some cases in two years—those it is intended to graft should be operated on in March. The operation of grafting young healthy seedling stocks is a simple one, and usually practised on what is called the whip-handle system, a slice being cut off the side of the stock after the head has been severed almost close to the ground, and a similar slice being cut off the scion—the two cut surfaces being brought close to and fitted together. If one is larger than the other, then the bark on one side of the scion must be fitted to that on the corresponding side of the stock, or no union can take place, and then the two must be bound firmly together. Afterwards some grafting clay must be applied, and it will be an advantage if some earth in the shape of a ridge is raised around the grafts, as success depends upon the air being kept from the cut parts until the bark unites and circulation sets in from one to the other. Budding is even a simpler operation than grafting, and should be performed in summer, usually in August; it is done in the same way as in the case of Roses—making an incision in the bark in the side of the stem near the ground, slipping in a bud, and winding a strand of matting round it a few times till it is firmly fixed beneath the bark. When spring comes round the stock can be headed back to the bud, and the whole force of the roots will then be set to work to supply that single bud. A very vigorous shoot will be the result, which may either be trained up to form a standard, or stopped when of sufficient height to induce side shoots to start away and form espaliers, or whatever form it is wished to adopt. Both in budding and grafting those who do succeed owe some of their success to careful supervision. It will not do to bud or graft, and forget everything else. The clay may crack and let air in, the sap which is busy healing the wounded parts be dried up, and those parts perish for want of necessary moisture. Again, after the young shoots have burst forth, care is needed to prevent the wind blowing them off, or

the matting may lacerate the swelling bark and need loosening. These are details which, to the thoughtful man, will be self-evident.

APPLE TREES FROM CUTTINGS.—For raising small fertile trees of particular kinds this is a very expeditious way. I have trees of the Mank's Codlin that were branches of several years' growth when sawn off bearing trees about ten years ago, and no matter how bad the seasons have been they have never failed to bear. I do not think this way of raising Apple trees, especially for small gardens, is appreciated as it ought to be ; and it is not clear to me that a good many sorts of Apples, besides those from which cuttings are usually taken, will not with a little care and patience strike root from old wood planted in a shaded border. I have at different times planted a lot of cuttings of various kinds of Apples. Old pieces a yard or so long, with thick truncheon-like knobs at the bottom, are the best to plant. They should be planted firmly, burying a foot or so of the bottom, treading them in very firmly and mulching the surface between the rows to keep the soil steadily moist and at an equable temperature. Apple trees raised from cuttings in this way are fibrous-rooted, and as the trees draw their food from the surface, the foliage, blossoms, and fruit all show a marked improvement owing to their food supply coming from a source more immediately influenced by the sun's warmth.

SUMMER MANAGEMENT OF APPLE TREES.—In the case of young trained trees the chief work will consist in laying in the young wood destined to form the tree, and checking undue growth in all other directions. In good soil I have always been in favour of planting maiden trees. We have thus the direction of their onward progress in our own hands almost from the beginning, which, in point of advantage, is next to propagating our own trees. In the formation of trees on espaliers the bottom pair of branches will get a year's start of the second pair, and so on till the trellis is covered. Unless this is done the top of the tree would rob and ruin the bottom, from the natural tendency which the sap has to ascend in vertical lines. The same rule should be observed in all systems of training, as the same natural laws are in operation. As regards summer pruning, a reckless cutting away of every green twig will do harm, because its tendency is to dwarf and cripple the energies of the tree. At the same time, if this young summer growth is permitted to remain too long unchecked or unshortened, mischief will accrue from disorganised root-action. The best way to deal with fruit trees in summer is to prune the strongest half of the tree, which will nearly always be the top, first, and the weaker half a fortnight or three weeks later. This

delay will drive the sap into the bottom of the tree, and although the amputated shoots on the upper part of it push out laterals in due time, which, if permitted to remain, monopolise the tree's force, still the check of pruning the top first, by stopping the outlets and forcing the sap into the lower branches, though it may be kept up only for two or three weeks, will have visible effect, and certainly tends to maintain the balance of power in the tree without adding anything to the labour, or calling for more care and skill. The little bush trees on the Paradise stock only need a little thinning of the young shoots to permit the air to circulate freely among the foliage, and this will probably require to be done about the end of June or beginning of July. It is as well in all cases of summer pruning not to be in too great a hurry to begin; let the trees feel for a short time the impetus which a considerable surface of leafage alone can give; then, when the check is applied, prune gently. This is the common-sense way of doing summer pruning, at least as I regard it.

WINTER MANAGEMENT.—This, in the case of standard trees, includes what little pruning is needed, which should be done annually. The object of such pruning is to let light and air into the centre of the trees, and to encourage regularity of growth by the removal of any branch which is growing in a wrong direction. If this is done when the branch is small, only a slight wound is left, which soon heals over. The eradication of Moss and other parasitical growth is work which should be done in winter. The trunk and the large branches may be scraped and then white-washed with hot lime, and the smaller branches could be dusted over with newly-slaked lime when damp. Apart from its use in destroying Moss, lime has a beneficial influence upon fruit trees, especially in a non-calcareous soil, as fruits use up a good deal of lime in the formation of their seeds and seed vessels. In orchards where the Codlin moth has been prevalent, the cleaning and dressing of the trunks of the trees will help to destroy the larva of the moth, which, in large numbers, secrete themselves in the crevices of the Moss-covered bark. The autumn and winter, too, is the season for top-dressing and otherwise improving the condition of poorly-nourished trees; and there are plenty of them about—one need not go far to find them. This is scarcely to be wondered at, when everything the tree produces, even its leaves, is taken away and nothing brought back; therefore it is only a question of time as to when exhaustion shall set in, and the other train of ills which usually accompany poverty, or follow closely in its wake, make their presence felt. There are many ways of helping exhausted fruit trees; the readiest method seems to be the appli-

cation of manure in some form. Liquid manure is specially valuable for exhausted fruit trees of all kinds, to be applied at any time. A very good way of using it is to make holes with a crow-bar of suitable depth according to the position of the roots, and pour the liquid manure in the holes until enough has been given to moisten and enrich the soil surrounding the roots. This will hardly be accomplished at one application.

PRUNING TRAINED TREES is chiefly done in summer, but there will always be the trimming and polishing of snags and spurs to be done in winter, and the renewing of ties in the case of espaliers or wall trees. In training trees the branches must have room to grow. Whatever the ligature is comprised of, it must not be tied too tightly. I have generally used small sprays of the Golden Willow, which will last very well for one year, and may be grown and made ornamental in every place, even the smallest, as a wet or even a very damp situation is not essential to their culture for this work, because the smaller and tougher they are the better.

HEADING DOWN OLD TREES.—This sometimes turns out successful. A young head is placed on old shoulders, which adds to the tree's usefulness and life. To make its success certain, there must be a good deal of latent vigour in the roots when operated on. Occasionally we see trees with an appearance of being prematurely stunted, as if the sap vessels were contracted and unable to carry on the work. Cutting off the head will induce new vigour into the tree by setting up a more rapid circulation. The height at which the branches must be cut depends upon the kind of tree operated on, and each case should be considered on its own merits.

INSECTS AND DISEASES.—The chief of these are American or cotton blight, the Codlin moth, and canker. There are other less injurious pests, such as aphides and grubs, which curl up and eat the leaves, but they yield readily to the usual remedies, which have been found effectual in the destruction of other grubs. The American blight when it gets established in a garden or orchard is a serious evil. I had it some years ago, but managed to clear it out by rubbing Gishurst compound into all the cracks and crevices where it had effected a lodgment, and by using the garden engine freely on the trees in summer. The same treatment will destroy it elsewhere. Paraffin oil blended with soft soap or Gishurst will probably make the latter more destructive, and there is great virtue in cleanliness. Scarcely any one uses enough water over the foliage of their fruit trees. Where the water is laid on to the garden, and there are plugs at

frequent intervals to attach the hose, a wash once a week during summer will do much to keep the trees clear and healthy, especially near towns. In some places the Codlin moth causes much destruction to the Apple crop. The only remedy is to stamp it out by destroying the insect when in its larva or chrysalis state. To this end all fallen Apples should be gathered up daily, as it will be found that (except in the time of gales of wind) each Apple contains, when it drops, a little maggot, which is in the act of eating his way out, and will in a short time emerge, either burying itself in the soil at the foot of the tree or finding a hiding-place in the crevices of the bark, there to sleep till the increased warmth of spring wakens it up and transforms it into a moth, ready to begin its little span of life as a perfect insect. Sometimes they are trapped by winding hay-bands or old rags round the trunk of the tree, and destroying the insects which seek the coverings as snug places to hide beneath.

CANKER IN FRUIT TREES, especially in Apple trees, has often been the subject of discussion, and the conclusion arrived at by practical men is that it is caused by deep rooting in a bad sub-soil. To give weight and force to their arguments it has been stated with truth that lifting the roots and placing them near the surface in a good loamy soil has always effected a cure. The theory that frost or a bad climate will produce canker has often been advanced, but is only borne out when the wood has become softened and vitiated by deep rooting. It has been asserted latterly that canker is caused by insects, but I cannot help thinking that those who say this are led, by the undoubted fact of insects being present in the cankered parts, to suppose that they are the cause instead of the effect. The insects which feed upon living healthy tissue are few in number compared with those which subsist upon the diseased and the dead. Still the sum of human knowledge is advancing, and our minds ought always to be open to receive facts which can be vouched for, even if they upset our preconceived ideas. If canker is caused by boring insects, the microscope should enable us to discover something of the beginners of it; and if its existence in fruit trees is traceable to insect agency, why not all vegetable diseases which have commonly been grouped under that head? Altogether this opens up a very wide subject.

ROOT PRUNING AND ROOT LIFTING.—Except in the best, driest, and warmest soils, deep rooting never has a beneficial tendency. The farther the roots get away from the sunshine, the longer the joints, the more water in the wood; and the the trees will bear less fruit, because, with so much water

in their system, our almost sunless seasons cannot drive it off and mature the wood sufficiently to produce blossoms. If the upper foot of soil could be kept fairly furnished with roots, the few that will penetrate deeper would do no harm. It is when, through bad management, all are driven down that root pruning and root lifting become necessary. Where the trees are comparatively young, *i.e.* not more than from eight to ten years planted, the best remedy is carefully to dig up the tree, beginning far enough from the trunk, so as to save as many of the roots as possible, replanting with those spread out horizontally, none more than a foot from the surface, and endeavouring by mulchings and top-dressings to keep them from striking downwards again. Trees that are too old or too large for lifting may still have their roots lifted and brought nearer the surface. In some cases of course, where the roots descend almost perpendicularly, they cannot be lifted and must be cut off. A rough-and-ready way of pruning the roots of over-luxuriant trees is to open a trench, say three feet from the trunk, save all the small roots, but cut off all thick ones, undermining the ball, and cutting off all the roots which are striking downwards. Only half the tree should be done at one time, the other half being deferred till the following year. When filling up the trench it will be a great advantage if fresh soil can be given and the old removed. The soil from the vegetable quarters will be better than filling in with the exhausted kind taken out, and there should be no difficulty in making an exchange of this kind.

LIST OF APPLES.—*Dessert kinds*.—Irish Peach, Red Quarrenden, Golden Reinette, King of the Pippins, Orange Pippin (Cox's), Ribston Pippin, Sturmer Pippin, Old Golden Pippin, Scarlet Nonpareil, Claygate Pearmain, Lord Burghley, Cockle Pippin, Old Nonpareil, Reinette du Canada, Kerry Pippin, Northern Spy, Fearn's Pippin, Court Pendu Plat, Dutch Mignonne, Duke of Devonshire.

Cooking Apples.—Alfriston, Annie Elizabeth, Keswick Codlin, Hawthornden, Lord Suffield, Mank's Codlin, Stirling Castle, Cellini, Stone's Apple, Blenheim Orange, Kentish Fillbasket, Striped Beaufin, Dumelow's Seedling, Warner's King, Norfolk Beaufin, Yorkshire Greening, Ecklinville Seedling, Waltham Abbey Seedling, Small's Admirable, Bedfordshire Foundling, Cox's Pomona, Hoary Morning, Northern Greening, Rymer, Winter Majetin, Mère de Ménage, Hambledon Deux Ans.

CHAPTER IV

The Pear.—Where the Apple thrives the Pear will generally succeed, as the two are closely related, and are both native fruits in their original forms. As regards the preparation of the site, the needs of both are identical or nearly so ; and in warm, sheltered, well-drained situations many of the better-class dessert Pears might be tried as

STANDARDS.—Marie Louise, Williams's Bon Chrétien, Louise Bonne of Jersey, and others of equal hardiness, will succeed under favourable circumstances in many places. The fruits from the open exposed trees are often superior in flavour to the same variety on a wall, except in the best aspects, though of course the wall fruit will always be of larger size. Standard Pears may be planted nearer to each other than Apples, as the branches grow more erect and less spreading. Twenty feet will be ample space between the trees, and with an undergrowth of bush fruits the ground will be profitably occupied till the Pears come into bearing. Lifting and replanting the Pear trees at the end of the fifth or sixth year, and laying the roots out to within 9 inches or 10 inches of the surface, will tend to hasten the period of permanent fruitfulness. Unless this is done on some soils, the roots of the trees will run down, and years may elapse before a full crop of fruit is gathered. As the seasons are now, the chief end and aim of the fruit-grower should be to keep the roots of the trees near the surface, and feed them by strewing rich mulchings over them, never using the spade, though a steel fork may be employed to lighten up and aerate the surface in the spring.

PYRAMIDS.—There are several varieties of this style of tree. There is the open unpruned pyramid, either on the Pear stock or on the Quince, and which is treated on the principle recommended for standard trees in the orchard, *i.e.* to be pruned a little at first to secure form and balance, but afterwards to use the knife only so far as is necessary to give the branches a free circulation of light and air. Such trees must have plenty of space to develop into a good size, and would make handsome background trees on the lawn or the foreground of the shrubbery. As regards the pruned pyramids, whether they are on the Quince or the Pear, the cultivator must make up his mind as to the course he intends to pursue beforehand. As a rule, any system which is imperfectly understood is very likely to be imperfectly carried out, and the end will not be satisfactory. To build up a handsome pyramid the

natural upward growth must be checked. This can only be done by pinching the growth in summer, and by a very judicious application of the knife in winter, aided with an occasional lifting of the roots. No one should be allowed to pinch or prune the branch of a tree without thinking out the whole matter of the object sought to be obtained, and the probable effect which a certain operation will have upon the work in hand. We know that if we take a young Pear shoot—say from 6 inches to 8 inches long—and pinch or cut out its point, the first effect will be to throw additional work upon the leaves and buds below. The sap which had found a channel upwards would force its way laterally, and for a time, till the development of new outlets, the strengthening of the back parts would be effected, but this diffusion of growing force would never again be altogether fully centralised. In the course of time, it is true, new outlets would be made; but if these in turn were judiciously stopped, the main buds and leaves at the base would receive a new impulse which would assist in making them strong. Leading shoots, unless they become gross, should remain unstopped, as well as all shoots which may ultimately be utilised in the formation of the tree, and these will constitute permanent outlets for growing force. The building up of pyramidal Pears cannot be done without the use of the knife, or at least without pruning. If we start with a maiden tree, after cutting back the main shoot, time will be gained if the next year's growth be pinched in summer, when as much wood has been made as will constitute a reasonable annual progress. To leave all the young wood in a tree, if it is to be subjected to any kind of training for even a short period after the annual progress has been arranged for, is calculated to upset its balance, and cause it to lose form and condition. Besides, trees which bear their fruit on spurs, either on those of natural or artificial creation, should never be permitted to run their strength to waste—a practice common to those who will take no pains to master the why and wherefore of summer pruning.

ESPALIERS.—I look upon this as the very best and simplest of all kinds of training for the Pear. The only objection is the cost of the espalier wires, though this is not so much as it was a few years ago. Espalier Pears are never out of place. They may be planted in successional ranks or lines, filling up a whole quarter or a large space anywhere, with a tolerable certainty that the chances of failure are very remote, or if they fail, no other kind of tree would have been likely to succeed in that particular situation. Though not absolutely necessary, it will be better to have the espaliers erected before the trees are planted. No one nowadays

should erect espaliers less than 5 feet high, and they may with advantage be higher. If strong well-grown maiden trees can be had, I should recommend them; but rather than plant weak maidens I should select good trees one-year trained. No one can dig up a tree and move it from one part to another of the same garden without checking its growth; and though this may not inflict any injury upon a robust subject, it would probably do so to a weakly tree. If the tree so transplanted had to undergo a journey from perhaps a distant nursery, its debilitating effect would remain for a long time. This is why I think weak maidens should not be moved at all the first year. The mode of clothing the wires of an espalier with branches is well understood by most, and indeed the whole matter is so simple as to need but little explanation. The formation of the tree begins at the bottom, and to give the bottom branches a start the central or leading shoot is headed back to the second wire. For the first three or four years, at any rate, only one pair of branches should be made annually. Later on, when the growth becomes more rapid, sometimes two pairs of branches may be started by pinching the leader in summer back to the wire, and laying in a pair of laterals, which will generally break away at the point stopped. When the espaliers are more than 5 feet high,

THE PALMETTE VERRIER system of training may be adopted with advantage. This, I need hardly tell many of my readers, is a modification of the horizontal and the vertical. The shoots are taken from the main central stem in pairs, at first horizontally, to the outside of the space the tree is intended to cover, and are then led upwards vertically till the top of the fence or wall is reached, the system being just as well adapted for wall training as for espaliers. All the future branches are manipulated in exactly the same manner. It is exceedingly simple—calculated to keep the bottom well furnished, which the espalier system, pure and simple, sometimes fails to do, and is also an expeditious way of furnishing a given space. A word here as to the use to be made of the Quince stock. They are useful in ungenial soils and situations, but should not be employed where the soil is light, or the fruit will be gritty and small, and the trees short-lived. The stock in all cases should be buried in planting, and the trees heavily mulched in summer. The manure should be raked off in February, and the surface lightly stirred up with a fork; this will sweeten it, and correct the close pasty character which a soil always covered assumes. Before the weather becomes very dry the mulch should be renewed.

CORDONS.—This system of training has not yet come generally into

cultivation, though no doubt it is destined to fill an important niche in the fruit-grower's *répertoire*. There are plenty of vacant spaces on garden walls where one or two branched cordons might profitably be planted. They may be trained in any direction, either upright or more or less oblique, the latter being the best shape, as vertical training has always a weakening effect upon the base, and should not, except under circumstances where it cannot well be avoided, be adopted. In no case, if permanency be desired, should a space less than 12 inches be left between the main branches, and it will, in the long run, be found better to give a little more space rather than less. As time advances, the reason of this will become obvious. Good foliage and strong fruitful buds cannot be reared without an abundance of light, and close training does not permit of that. This may not be so evident for the first few years, but after a time the spurs spread out, and the foliage from the laterals on one branch meets and overlaps, it may be, its neighbour's, shutting out its legitimate share of sunshine, and destroying, or at least injuring, its chance of continuing fruitful. Near the centre of the trees this will be more apparent, and very much mischief is now being done by this covetous method of training fruit trees, covering up amid a dense mass of foliage every bit of bare wall, forgetting that one of the objects of a wall is to improve the climate by absorbing the sun's rays during the day and giving the heat off again at night. Cordon Pears or Apples may be used to utilise any bit of land where the situation is sheltered but not shaded. Wherever it is convenient to strain a wire, there a Pear tree may be planted. A bit of land may be covered with wires strained a foot or so from the ground, 18 inches apart, and quite a collection of Pears planted, which may become most interesting—only the roots must be kept near the surface, and if on the Quince, the surface must be heavily mulched. Such trees often escape spring frosts, when the blossoms on larger and taller trees are destroyed; they may also be very easily protected, and a crop be made a matter of certainty.

PEARS ON WALLS.—The valuable late fruits should occupy the best aspects, and the early-ripening sorts, such as the Jargonelle, Doyenné d'Été, etc., be planted on the worst. As a rule the east and west aspects are planted with Pears, the south wall being reserved for Apricots and Peaches. The mode of training Pears on walls is a mere matter of taste. The tree thrives so well under any system of training, that no system need be exalted at the expense of another. If I have any preference it is in favour of the horizontal, to be merged into the Palmette Verrier for tall walls. The training in the last two methods is so simple, and there is no

danger of being tempted to crowd too much wood in as there is with fan training. The distances between the trees must depend upon the nature of the soil, the mode of training, etc., and if the trees are on the Quince or the Pear. Wherever the soil is good and deep, or can be made so, have the trees on the Pear stock, using the Quince on cold heavy soils only. On the Pear stock trained horizontally, plant from 15 feet to 18 feet apart; if on the Quince, half that distance will suffice. Fan-trained trees may be planted from 14 feet to 16 feet apart; palmettes, from 7 feet to 10 feet, or 12 feet is a good distance and permits of the wall being quickly covered; cordons, 18 inches; two-branched cordons, 3 feet. After the trees have been planted a few years, they often develop considerable vigour, especially where the soil is good. When this period arrives it is a good plan to lift the roots, undermining the ball so as to reach any that may be running down perpendicularly. Sometimes the trees may be altogether lifted out and replanted, especially if they are too crowded; or if too much space has been allowed they may be drawn nearer to each other. Lifting will give an opportunity to rearrange them as regards distance.

SUMMER MANAGEMENT.—The most important item is the manipulation of the young growth. The chief work of a plant is performed by the leaves. In them is concealed the laboratory where the sap, which comes up in immense quantities from the roots, is distilled as it were, the waste passing off into the atmosphere in the shape of vapour, and the small modicum of useful matter is spread over the whole plant in the shape of new growth. Now it will be easily understood that neither men nor plants in a crowded condition can do as much work as where each has room to strike out. In fruit growing the sun is everything; it is not only colour and flavour, but the blossom of the fruit in its first germ, stimulating the action of the leaves and dissipating the crude watery matter from the young wood, which will in due course produce the fertile buds. The intelligent cultivator will work with the sun all through the summer, though of course only as a very humble assistant. He will keep the young growth thin, so that there shall be no overshadowing of one part by another. In the spring something more might be done in the way of disbudding. Many buds burst and grow a few inches, which are no use as factors for the future crop, but rather the reverse, for, if left, they tend to fill the main branches with useless spurs. These might with advantage be rubbed off when quite little, as small leaves that cannot become large enough to foster a fruit bud are better away altogether. As the summer advances the young wood which forms the key of the position will require

very careful management ; but no hard-and-fast line should be laid down. If the character of each particular tree be studied, that will form the best guide as to the right course to adopt. A weakly tree may have its liberty for a time to feel the impetus which a larger breadth of leafage will give, always insisting that there shall be no undue crowding of parts, as three or four good stout leaves are better for the work in hand than a dozen thin puny things. Again, a tree which has settled down into bearing freely will not overburden itself with useless spray, and the pruner need not for the sake of uniformity pinch off every spray or green leaf projecting beyond its fellows. One of the objects the pruner should have in view in summer is to do all in his power to equalise the flow of sap to all parts of the tree, so that it may maintain its fertility all over the surface. As a rule, the sap flows upwards in straight or vertical lines with greater freedom than in any other direction ; and when the summer pruning begins, say about mid-summer, dividing the work into at least two periods, pruning the top half of the tree three weeks before the bottom half will help to strengthen the bottom branches by turning a larger flow of sap into the bottom of the tree. During summer a tree not well balanced as regards strength can receive a good deal of help in this way. It is by working too much by rule of thumb that trees become debilitated on the one hand or overgrown on the other. Rightly understood, the young wood in summer gives the cultivator free control over the tree and its work. Wherever there is a gross shoot it should be stopped before uselessly robbing its neighbours. All leading shoots should be left unstopped till September ; the gentle stimulus these afford will be very beneficial. There are several ways of performing the operation of summer pruning. Some simply cut the young shoots off a couple of inches or so from the base ; others break them down, leaving them hanging attached to the tree by a portion of the bark and perhaps a fragment of wood. The principle and intention of this is quite sound, though it looks untidy. Another way of obtaining the same object is to pick off all the leaves but four at the base, and to leave the naked stem for a time on the trees, cutting it off with the scissors at a later period. The aim and object of both these methods is to minimise the check which must be given. The same object could be secured as well by distributing the summer pruning over a longer period, *i.e.* Take the shoots in rotation as they reach a given size, and pinch the ends back to four or five leaves. This seems to me to be the only really rational system of summer pruning.

THINNING THE FRUIT.—In the case of both Pears and Apples

this should be done if fine fruits are desired. As soon as it can be ascertained which fruits are taking the lead, the trees should be gone over, and all deformed imperfect fruits removed. It is better to have only three or four dozen fine handsome Pears or Apples on a tree than a much larger number of worthless specimens, as the latter only exhaust the trees uselessly. The crop may, if necessary (and it very often is, as few people have the courage to do enough thinning), be gone over a second time, and a final selection made. This can be deferred till August, as some of the fruits may be large enough for baking or stewing, and the thinnings may be utilised.

WINTER MANAGEMENT.—What are the objects sought to be obtained by pruning? We ought to be able to give an intelligent reason for the faith that is in us, and the acts which spring from it. In gardening, as in other things, this is an age of scepticism. Some say, "Do not head back your newly-planted trees—you are only wasting time;" others say, "Pruning is a delusion and a snare, if not worse; therefore do not prune at all." The object of pruning is to facilitate fruitfulness. If it does not build up a handsome fertile tree, then it has been wrongly conceived and badly executed. I think it might be demonstrated that all fruit-bearing trees, even the Oak, might in their early life be improved by judicious pruning. In the case of the Oak the pruning should be directed to the formation of a perfectly-balanced tree; in short, to mend Nature by relieving the leader from undue competition, and otherwise equalising the flow of sap by rectifying the balance of the tree. A somewhat similar principle should guide us in the management of orchard trees, and especially is this needful in early life. For the most part the trees in a nursery are crowded together, and the wood made under such conditions, although it may be strong and healthy, is not so well adapted to form the base of a tree destined for a long life as if each tree stood out singly. In all cases as regards orchard trees I recommend heading back in the early spring, just before the buds burst, the season after planting; for in no other way, in the majority of trees, can a good base be secured. In doing this the very weak shoots may be cut very close home, and the stronger shoots to four eyes. When the eyes break disbud the surplus ones, and the foundation of a handsome tree will be laid, in most cases, without any further trouble. In succeeding years the pruning will be chiefly confined to thinning out superfluous branches, or those which are badly placed. Those who neglect to prune will some day be landed in a difficulty, for good fruit cannot be obtained without a certain amount of pruning. If proof of this is necessary it may be found in hundreds of unpruned orchards. All pruning should be done as soon after the leaves fall as possible.

As regards the renovation of old Pear trees, reference is made to what has been said about the Apple, as the same treatment will suit the Pear.

In the case of trained or restricted trees, pruning is even more indispensable ; but when it has caused injury, which I admit it may if ignorantly done, it is not pruning as an abstract principle which has been at fault. It is the pruner who has failed to grasp the right idea ; but in most cases in the winter management of fruit trees the chief work, where the summer pruning was rightly done, will consist in cutting out dead wood, shortening back snags and long spurs, or thinning out the spurs where too numerous. This will only be necessary to a limited extent, unless the trees have been mismanaged previously for some years. In pruning, of course, it is absolutely essential that the pruner should make a study of each tree, because some trees produce blossom buds on the ends of comparatively long spurs. The Marie Louise Pear may be cited as a case in point. The sound, plump little buds that contain the future blossoms are so different from the longer thinner wood buds that no further reference is needed. Yet I remember one case where an unskilled pruner in cutting promiscuously did a good deal of damage to the future crops by not being able to identify the fruit buds ; but such ignorance is rare.

INSECTS AND DISEASES.—On suitable soils the Pear is a long-lived tree, and there is generally an absence of insect attacks and freedom from disease. Sometimes, indeed, the larva of a species of sawfly (commonly called the Pear slug, because of its resemblance to a small black slimy slug) makes its appearance about July on the upper sides of the leaves, where its work is very rapid, speedily eating off all the green matter, when of course the leaves fall and the trees are very seriously injured. I had to deal with a rather troublesome case on an east wall some years ago ; but I destroyed the insects by using lime-water through the garden engine. Lime dusted over the leaves from above was speedily effective. If a remedy is applied early there will be no great amount of injury done. *Coccus Pyri*, the Pear Scale, often attacks weakly trees ; but it is easily got rid of by washing them in winter, when the leaves are down and the buds dormant, with a strong solution of Gishurst compound, not less than 6 ounces to a gallon of water ; applying it warm with a spokebrush, rubbing it well in among the spurs or wherever the insects congregate. Sometimes the liquid is thickened to the consistency of paint by adding lime, soot, sulphur, and clay, and applied with a small brush. In bad cases this dressing is generally effectual. But when the presence of insects can be ascribed to the weakness or debility of

the tree, the judicious application of a top-dressing, or a thorough soaking of liquid manure, as recommended for Apple trees, will be of great advantage. In the spring and early summer the leaves of Pear trees are often curled up and injured by the larvæ of a species of moth, chiefly the *Tortrix Contaminana*; but these, if taken in time, need not cause much apprehension. The best way to deal with them is to go over the trees frequently and crush the maggots between the finger and thumb. A week of persistent effort will get rid of them. In dry hot seasons both thrip and red spider will attack the leaves of Pear trees. Soft soap and Tobacco wash will destroy thrip, and will also, with sulphur, banish the red spider; but in both those cases a good supply of water, and a free use of the garden engine during the warm summer evenings, will prove a good insecticide, and add to the health and strength of the trees at the same time.

PROTECTING THE BLOSSOMS.—Very few people attempt this, though a crop of good dessert Pears is as valuable as one of Peaches. It is true that Pear blossoms are more difficult to shelter than are the former, for by reason of the crop for the most part being borne on spurs they stand farther from the wall, and would be more liable to be damaged by nets or any textile coverings which might be used for the purpose. I have seen some advantage received by placing branches of laurels and other evergreen shrubs and trees among the Pear branches. Sprays of Hazel, Birch, and Elm, well furnished with small twigs, are also useful; if they do not save the crops they will at least do no harm, nor add to the cost of production. A coping made of branches of trees, projecting a foot or so from the wall, will be very useful. This may easily be obtained by straining a wire just under the stone wall coping, near its outer edge, and thrusting the sprays of shrubs between the wire and the coping, leaving the feathery ends to hang down.

GATHERING AND STORING.—It is possible to prolong the season of many kinds of Pears by proper and careful gathering. The usual plan is to gather the crop all at once, without seeing that every Pear is ripe enough to gather and store. Any one that has gathered Pears on this principle knows that whilst some fruits part from the stalk very easily, others on the same tree evince the greatest reluctance to be taken off. It is true that there will be a difference of time in the ripening period of these two fruits, but that difference may be made of a more pronounced character if the clinging fruit was allowed a few more days on the tree. This will be a very useful quality, where only a few Pear trees are planted, to keep up a succession of fruit. For instance, by adopting this

plan I have had the Marie Louise (one of the best autumn Pears) in season for a period of six weeks, when without some such plan the fruit would have gone bad in less than three weeks after the first dish was fit for table. Pears are ripe enough to gather (and the same rule applies to Apples also) when the fruits part readily from the stalk, *i.e.* if, when we take a fruit in the hand and lift it up—bringing a leverage to bear upon the stalk when it reaches the horizontal position—it becomes detached and remains in the hand, that is sufficient evidence that it is fit to gather. When the seeds or pips assume a dark mahogany tint, and the foliage puts on that ripened appearance which tells that their work is finished, the fruit may be gathered. Great care must be used, as the least bruise will result in premature decay. Early Pears, such as Doyenné d'Été, Williams's Bon Chrétien, etc., should be gathered a few days before they are ripe. The Jargonelle may be had good fresh from the tree, but all the Bergamottes require a fortnight in the fruit-room. If late Pears are gathered too soon the fruits will shrivel, and be deficient in quality. The best way to keep winter Pears is to pack them in drawers or in some position where the light will be kept from them. After the first week or so shallow trays or boxes just deep enough to hold one layer are very suitable; they do not occupy much space, as they may be packed away one above the other, placing the late fruits in the bottom, and those which will be required first where they can be easily got at. The fruit-room should be frost-proof and equable in temperature. A dry cellar makes an excellent store-room for fruit. Some of the late Pears, such as Beurré Rance, Ne Plus Muris, etc., require to be helped by a higher temperature a week or ten days before they are required for use—*i.e.* supposing the usual time of a fruit's ripening is in January, move a few at a time about the beginning of the month to a warm cupboard in the dwelling-house. This will bring up the flavour, and reduce the hard turnipy flesh to an agreeable melting condition.

PROPAGATION. — Little need be said on this head, further than to urge all to give more attention to it, as the surest way of increasing the fruit trees in the country is by creating a greater interest in their culture. There are three ways of propagating Pear and other fruit trees. First by seeds which any one can save and plant at any time. It is so easy when eating a Pear we like to save the pips, and at the first opportunity plant them in a pot of soil, and place the pot, duly labelled, in a frame, with other similar experimental efforts. In due time the seeds will grow, and as the season advances the young Pear trees should be planted in a nursery line in the experimental bed. In a couple of years or so they will

be strong enough for grafting or budding any old favourite kind upon, or if preferred they may be transplanted and left to fruit, in the hope of getting a new and improved kind. Very many good fruits have been raised in this haphazard manner. The second and really scientific way would be to grow the trees in pots in an Orchard-house and fertilise the blossoms artificially, at the same time taking effectual steps to keep all other agents away. The next is grafting. When the stocks are as thick as one's thumb they may be grafted, which is a very simple operation, requiring only one thing to be borne constantly in mind—that the bark of the stock and scion must meet on at least one side, or there can be no union. Standard trees may either be grafted standard high, or the grafts may be put on close to the ground and the stem formed of the first effort of the graft. Those who have had no experience in grafting may acquire dexterity in the work by practising upon common trees and shrubs, in order to get the right idea of fitting the two cut surfaces together. Whip-grafting is the best system to adopt, and consists in cutting the head off the stock in a slightly slanting direction, taking a thick slice about $1\frac{1}{2}$ to 2 inches long from the lowest side of the stock, and fitting the graft to it by cutting a corresponding slice from its side. The knife must be sharp, and it is important that the stock be in advance of the scion. The stock buds should be just bursting, showing that the sap is in active motion, but the scion may be only just a little bit on the alert. The scions should have been selected when the trees were pruned in winter, and laid in half their depth in moist earth in a shady border on the north side of a wall or fence. The grafts should be tied in and clayed as soon as the operation is performed, and it is a good plan, where convenient, to form a ridge of earth round the row of grafted stocks to prevent the clay from cracking. This can be easily done when the stocks are grafted near the ground.

BUDDING PEAR TREES is more practised now than it was years ago, and the trees originated by this method are equal, if not superior to, grafted trees. The work is done in summer, when the young wood is in a suitable condition, in the same manner as Roses are budded. There is yet another kind of grafting, which is performed in autumn and owes its origin to the French cultivators, who are very expert in the pruning and training of fruit trees. Some people say it is the climate which brings them success; but that is rather begging the question, I think, though of course I admit that the climate of the south of France is better adapted for fruit-growing than these islands. The grafting referred to consists in transferring the fruit buds from a fertile tree and

grafting them into the branches of any tree deficient in fruit buds. It is a very tedious job to do on a large scale, and for that reason I do not think it will ever become popular in England—still, the thing is feasible enough. It should be done early in autumn, as soon as the fertile character of the buds is fairly established.

VARIETIES—*For Walls*.—Bergamotte Esperen, Beurré d'Arenberg, Beurré de l'Assomption, Beurré de Rance, Beurré Superfine, British Queen, Brown Beurré, Chaumantel, Doyenné du Comice, Easter Beurré, Gansel's Bergamotte, General Todtleben, Glou Morceau, Huyshe's Prince Consort, Jargonelle, Josephine de Malines, Marie Louise d'Uccle, Passe Crassanne, Passe Colmar, Winter Nelis.

These varieties have rather more need of protection than others. Many of them will succeed on the Quince, as pyramids in a sheltered situation. Of course all Pears will succeed against a wall; but as in most gardens the wall space is limited, all that can be grown as standards or pyramids should be so cultivated.

For Standards and Large Spreading Pyramids on Pear Stock.—Jargonelle, Bon Chrétien (Williams), Beurré d'Amanlis, Aston Town, Beurré d'Anjou, Beurré Diel, Beurré Bachelier, Beurré Hardy, Bishop's Thumb, Jean de Witte, Louis Bon of Jersey, Marie Louise, Knight's Monarch, White Doyenné, Pitmaston Duchess, Ne Plus Muris, Seckle, Durondeau, Summer Beurré d'Arenberg, Vicar of Winkfield, Uvedale's St. Germain, Suffolk Thorn.

For Pyramids on Quince Stocks.—Baronne de Melo, Bergamotte Esperen, Beurré d'Anjou, Beurré Bachelier, Beurré Diel, Conseiller de la Cœur, Doyenné Boussach, Doyenné du Comice, Duchesse d'Angoulême, General Todtleben, Louis Bon of Jersey, Marie Louise d'Uccle, Van de Weyer Bates, White Doyenné, Bon Chrétien (Williams).

CHAPTER V

The Peach and Nectarine.—The characteristics of the Peach and Nectarine being interchangeable (*i.e.* a Peach stone may produce a Nectarine, or *vice versâ*) for all practical purposes, they may be classed as one. The same uncertainty exists as regards the large and small-flowered varieties, they also being interchangeable. It is thought by some that the small-flower Peaches and Nectarines set better, or, in other words, they suffer less from cold weather in spring than the large-flowered kinds. This coincides with my own opinion and experience; but so many of the best varieties have large flowers, which cannot be dispensed with, at any rate at present,

that the question of discarding them cannot now be entertained. Still, it is a matter that might be kept in view and further evidence collected.

SOILS.—All stone fruits do best in a calcareous soil, as lime is a necessity for them, so much being used up in the manufacture of the stones containing the seeds. I am convinced, from actual experience, that much of the weakness of wood and blossom, and the falling of the fruit during the stoning time, is owing to the scarcity of lime in the soil. It is very easy to add lime or chalk to a soil when needed. Some recommend it to be given in the shape of old mortar rubbish mixed with the soil, others give the crude raw chalk. Sprinklings of air-slacked lime on the surface of the border, lightly forked in, will answer every purpose. There is no doubt that turfy soil, *i.e.* soil full of the fibres of grasses and other plants, gives a stimulus to growth, especially in the early life of the tree. And if, when the encouragement from that source fails (in time it must inevitably do so), fresh turf could be placed round the roots, the lives of the trees might be prolonged indefinitely; but this is just the very thing which only a few can do. Turfy loam is very difficult to get, as no one likes to have the turf pared off their best pastures; and to purchase such material in the suburbs of towns makes fruit-growing very expensive. Where loam cannot be obtained, the natural soil may be improved for fruit culture by a little trouble and foresight. First there are the parings from the edges of the roads and walks; then there are sure to be ditches requiring to be cleared out and deepened. Occasionally there are ponds and water-courses to be improved and cleared. Then there is *débris* of all kinds, from the prunings and cuttings of hedges, trees, and shrubs to the weeds and refuse which are constantly accumulating. If the soil is heavy, there are lumps of clay, which may be exposed to the action of the fire, and added to the heap of other matters to open it up and correct its acidity. Wood-ashes again, may, with soot and lime, be added. In this way, by looking far enough ahead, the fruit borders may be made more productive without increasing the cost; the compost may be added as a top-dressing, or be placed round the roots when lifting takes place.

PREPARING THE BORDER.—In the first instance, or in remedying any neglect subsequently, if the subsoil is bad, the roots must be kept out of it. This can only be effectually done by having an impervious bottom to the border—4 inches of concrete will do; and if there is coarse gravel, brick rubble, or stones on the place handy, then concrete will be cheapest. The bottom of the border should be of the right inclination to throw off the water before the

concrete foundation is laid; 1 in 12 will generally suffice for that purpose, and if needful a drain should be run along the front of the border. The concrete, in the case of a high wall and wide border, need not extend all across the border; from 6 to 8 feet will be quite enough, as if the roots descend when they have passed over the concrete they can be lifted periodically; in fact this will be a great advantage to them, as it will give an opportunity to examine their condition and add a little fresh turf or compost if needed. It is an excellent plan, where the soil is not naturally adapted for the choicest kinds of fruits, never to lose touch altogether of their roots. For the culture of fruits good brick walls are best, and they are also cheapest. Some day, perhaps, glass may take the place of bricks to a certain extent, but it will be a gradual process; and for many a year brick walls will enclose the gardens of first-class villas. For stone fruits flues in the walls are a great advantage, though I suppose scarcely any one builds them nowadays; but, as I remember them years ago, they were useful to ripen the wood in autumn and to ward off frost in spring. Another advantage they had—peach walls in those days were always dry by reason of their being hollow. A flued wall, even if the fires are never lighted, is better than a solid one, because it is drier, and consequently warmer. The height of the wall will vary according to circumstances and position, but for a garden of an acre 12 feet is a nice height. The coping should be sound and good (York stone being the best), projecting on each side 3 inches, the lower edge of the coping being grooved to collect and cast off the water clear of the wall. A zinc gutter under the groove to carry off the water would be a great improvement.

PLANTING.—The border should have a month or two to settle before the trees are planted. The peach will move successfully when of considerable size, but if such trees have to be bought the expense will be considerable. Taking all things into consideration, if I had a peach wall to furnish I should not select trees older than one year, trained, nicely balanced as to branches, with the wood of moderate strength and well ripened. The trees should be bought early in autumn and brought home. If the borders are not ready for planting, the trees will take no harm if the roots receive the necessary trimming and are heeled in somewhere. Select those trees only which have stout healthy stems, and are free from all appearance of canker and gum. It is certain that some trees fail through want of reciprocal action or lack of fitness for each other in the stock and scion. The trees should be planted before Christmas. I like to plant about 14 feet apart, and rearrange the trees at a future time if more room be needed. If the wood is well

ripened, and there is an equal number of shoots on each side, very little heading back will be required, only removing the unripe points of the shoots, cutting to a wood bud, as the disbudding which peaches are submitted to will always equalise the flow of sap. As a rule that mode of training is best which satisfies us most, for it is certain that anything we are prejudiced against will not succeed in our hands. Fan training is the system generally selected for stone fruits, and that shape is generally given to them in the nurseries; it possesses one great advantage in offering facilities for filling up vacancies when a branch dies. But the very principle which is thus an advantage is also, in most people's hands, a disadvantage, because it permits (I had almost said encourages) that overcrowding of branches which is the bane of stone-fruit culture on walls. Other systems of training are the horizontal pure and simple, and the horizontal with an upward tendency. I find the latter plan to answer well. The young trees were bought in as maidens, planted without heading down, the main shoot was trained up vertically, and the side shoots laid in with a rise of one foot in six. The bottom of the wall will be the weak place, as it is in all kinds of training, but the difficulty is not felt in the case of young trees; and as the trees grow older the difficulty must be met by dropping down the main branches of the tree and opening the centre. This will be required sometimes, no matter how the trees are trained.

DISBUDDING.—The Peach bears its fruit on the young wood of the previous year, and in order to have the wood strong and well ripened it must be thinly placed on the tree, hence the absolute necessity for disbudding. There will probably always be a difference of opinion as to the best time to do so important an operation. Some say, Disbud as early as possible, for a tree suffers less when its shoots can be rubbed off very early, leaving little or no scar behind. Others say, Leave the young shoots on for a time to shelter the young fruit in our cold springs. For myself I like to begin disbudding early, but should not think of doing the work during a spell of cold weather. Of two evils choose the least, and I think if the disbudding is done early—during, say, a week's genial weather—no great check will be given or harm done. It is better to do the work tentatively. Say, first, we go over the trees and remove all foreright shoots, which perhaps I need not explain are those that grow straight from the front of the branch; and as these will be of no use to lay in, they should be removed early. In disbudding the side shoots it will, or at least should, be kept constantly in mind that the healthiest and best one at the base of each of the present bearing shoots should be left

for taking its place ; and as Peaches will not remain on the tree without the presence of a leader at the end of each branch beyond the fruit, this also must be provided for. Thus, when the disbudding is finished—in the case of a full-sized tree at any rate—there will be one healthy-growing shoot at the base of each bearing shoot, for the purpose of taking its place when it is cut away, and another young shoot at the end to carry on the circulation. During the season, if the wood appear crowded, the leading shoots may, to make room, be pinched back to 6 or 8 inches, but the shoots at the base should be laid in full length. By far the greater number of fruit-growers lay in the young wood indiscriminately, whether it comes on the upper or lower side of the branches. They act on the principle of filling the space as quickly as possible. Looking at the matter from a scientific standpoint, it would be an advantage to take the young wood only from the upper side of the branches. It is true that when we have a wall to fill, the exigencies of the situation often compel us to take the wood where we can get it, and spread it over the surface of the wall as speedily as possible. Still, where the disbudding and other cultural work has to be done by persons of limited knowledge and training, it is easier and simpler to work according to a plan which lays down exact rules for our guidance, rather than one which leaves a good deal to individual judgment. If the disbudding is finished in the course of three weeks or a month, no great check will be given, and the young fruits will not be unduly exposed. As the young shoots progress they will require to be laid on either by nailing or tying, or else some windy day or night many of them may be broken down and ruined.

THINNING THE FRUIT.—This should take place as soon as all danger of frost is over. It is difficult to advise as to what should constitute a crop of Peaches or Nectarines ; and after all in the case of fruit-crops most people please themselves, and as a rule injure the trees by over-cropping. There is a good deal of covetousness in average human nature, and perhaps it is no use railing against it. And I will say, further, that Peaches should not be nearer to each other than 6 inches, if fine good-flavoured fruit is required, and it is wished that the trees may have a long and fruitful life.

MULCHING AND WATERING.—These are important matters, as much needed help may be given by a coat of manure spread over the surface in summer or hot weather, when the tree is carrying a heavy crop. Watering both at the root and over the foliage is also a necessity—in fact it does not receive sufficient attention. There would be fewer unhealthy trees if the borders were better made and the roots kept more under control, and if, in times of pres-

sure, their wants in the shape of food and drink were regularly attended to.

GATHERING THE FRUIT.—Peaches should never be allowed to hang long enough on the trees to fall of their own accord, for, if bruised, they get black and decay immediately; and in gathering they must be handled very carefully. Take the fruit in the hand, grasping it with the ends of the fingers, distributing them round the fruit, bringing the leverage (the little, at least, that is required) to bear upon the back of the fruit near the wall. If a moderate pressure detaches the fruit, it drops into the palm of the hand without any damage, and can be placed in a basket lined with cotton wool. Where a layer of fruit is placed over the bottom of the basket it should be laid in the fruit-room, on a shelf on which a sheet of cotton wadding has been placed. When gathered three or four days before they are ripe, Peaches may be kept a week or longer in a cool room in very good condition. In order to secure high-coloured, well-flavoured fruit, as it advances to the colouring stage the leaves which hang or project over it should be pushed on one side. In some instances a whole leaf may be pinched off in order to let in sunshine and air. In others the removal of half a leaf will meet the case, and when the object of full exposure has been secured no more leaves should be removed, as they perform a most important work in the economy of the tree.

PRUNING.—When the fruit is all gathered, the branches which bore them should be removed to let in a flood of light to ripen the wood on which next year's crop depends. In the case of trees which are still extending, there will be less wood to cut away, as some of these bearing shoots will be required for extending. Still, all branches not actually required should be cut off and taken away. When the leaves fall, loose all the young wood from the wall and allow the air to play round it. The pruning will be finished in February, just before the flower buds expand, and will consist in smoothing with a sharp knife all rough surfaces occasioned by disbudding, and shortening, more or less, unripe wood, always cutting to a wood bud for the purpose of securing a leader. The blossom buds are always distinguishable from the wood bud when they begin to swell in February, the former being round and plump, whilst the wood buds are long and pointed at the ends. Frequently, too, the blossom buds are arranged in pairs, with a wood bud between them, and it is always safe to cut to a group of buds of this character.

INSECTS AND DISEASES.—It is better to prevent than cure, even when the remedy is certain and rapid in its action. As

regards the struggle with insects, health and vigour are the best antidotes, for vermin usually fight shy of a healthy tree. It is when the condition of the tree has been lowered by bad management that insects become so troublesome. The aphid family, the black and green flies, are very injurious, and, if neglected, very difficult to deal with, because they entrench themselves as it were in the curled-up foliage, where washes from the syringe cannot penetrate. Winter dressings of insecticide are very useful. I still use Gishurst compound; it is cheap, cleanly, and efficient. Perhaps among the more recent introductions there may be something better; but at present I have not met with anything. We use it by dissolving from 4 to 6 ounces in a gallon of warm water, and it is used when it cools down to about 90°. A brush is used for the thick branches, the young wood being washed with a sponge. This may be done any time before the buds become too prominent. As the season advances a constant watch should be kept, and if any insects appear, as sometimes they do, before the fruit is set, dust some Tobacco powder among the leaves and flowers. Later on it will be as well to use the powder, sometimes as a preventive, for the aphides dislike the smell of Tobacco. Two or three times during the growing season much benefit will arise from washing the trees with a weak solution of soft soap, or the soap suds from the laundry will be beneficial, applied with the syringe or engine. In bad cases tobacco liquor constitutes, with the powder above-named, a remedy that cannot easily be surpassed. This liquor can be obtained from the tobacco manufacturer at 1s. per gallon, and a gallon of it will make 6 gallons of wash, with a pound of soft soap added. Some use in addition, or alone, a quarter of a pint of paraffin oil. The oil and soap will blend at a low temperature, or when exposed for some time (several hours) to a temperature below freezing-point.

The Red Spider is a troublesome little fellow on light soils and in hot seasons. Water is the best remedy if used in time. Sulphur mixed in small quantities with the water will banish red spider, and is effectual in all forms of mildew. The way to apply it is to mix a small handful of sulphur with water in a saucer or basin into a paste, and then it will readily mix with a larger bulk of water. On dry soils, much subject to mildew and spider, it is better to use a little sulphur occasionally as a preventive, whether these pests are present or not.

Blister and Curl are the result of cold, and the cure will be found in more shelter. Peach trees should never be planted in a cold draughty place, as they will not succeed till by some means or other the cold current has been stayed. Screens of reeds have

been found of service, placed at right angles across the border. I have seen evergreen hedges used in the same way. Trees suffering from curl or blister (and I may say that the blister I am referring to is not the curl which comes later on, when the trees are attacked with insects) should have the bad leaves picked off, and be encouraged in every way to make more growth.

TRANSPLANTING LARGE TREES.—No other kind of fruit trees move with so little injury as the Peach does. The largest-sized ones may be moved without the loss of a crop if the work be done at the right time (autumn) and with care. I am persuaded that if the trees were oftener lifted, and if at each removal they had fresh soil placed round their roots, there would be fewer failures than at present. When a tree is in bad health lift it carefully up, obtain some turfy loam and place round the roots, laying them within 9 inches of the surface; and when hot weather sets in, give a coating of manure to keep the surface moist and encourage the roots to remain there. No observant fruit-grower requires to be told that short-jointed freely-flowering wood cannot be obtained from deep rooting—in fact the deep roots are of no use to wall trees, as they need no anchors to fasten them in the ground, and only encourage the production of watery sprays, which have to be cut away.

PROTECTING THE BLOSSOMS.—For more than twenty years I have been in various ways protecting the blossoms of fruit trees, and if I were beginning afresh now, with the accumulated experience of the past to guide me, I should have more faith in feathery sprays of Yew, or the common brake Fern, placed in among the blossoms, with a double thickness of fishing-net over all, than in the use of expensive nets or curtains. Twenty or more years ago I had a number of these appliances, but as they wore out they were never replaced, for we had lost faith in them. Healthy and vigorous trees seem to require less protection than weakly ones, therefore our chief efforts should be directed to the attainment of the former, and the work of protection will be much lightened; such, at least, has been my own experience. Glass, in any form, may be recommended, either as wide movable copings, or in lean-to or span-roofed houses; especially is it desirable in bleak situations. There will always remain a considerable number of trees where some simple form of protection (and the simpler the better) can only be given; and there is no better way than the one I have suggested, of sprays of Yew or Fern tucked under the branches so as to shelter the blossoms, with double netting over to keep off the cold storms and prevent the sprays of Yew becoming loose and blowing away.

VARIETIES.—The following are excellent varieties :—

Peaches. — Early Crawford, Hale's Early, Royal George, Noblesse, Condor, Goshawk, Lady Palmerston, Princess of Wales, Golden Eagle.

Nectarines. — Lord Napier, Rivere's Early Orange, Elruge, Humboldt, Pine Apple, Victoria.

CHAPTER VI

The Apricot.—The best walls for training fruit trees on are built with bricks, and they may vary in height from 10 to 14 feet, according to the size of the garden. Hollow walls are drier and consequently warmer than if built solid; they should be of sufficient thickness and strength to stand without pier or buttress. Where the foundations are properly laid, a 14-inch hollow wall will stand without support. The best soil for Apricots is a good sound loam of medium character as to stiffness, and, where possible, should be obtained from the side of a hill containing limestone—where possible I say, but of course in many places it is not possible. In my remarks on the Peach I have referred to the importance of lime to stone fruits, and the necessity for adding it in some form where it is deficient in the soil. When Apricots or Peaches drop at stoning time, it generally arises from a deficiency of lime in the border. The question is often asked, What is the right depth for borders? and various answers have been given. But on this as on most other matters concerning gardening we must take into consideration local circumstances, and the treatment the trees are to receive must carry weight. For instance, if the surface of the borders is to be dugged with the spade and cropped with vegetables, it will be of no use for fruit-growing, and the roots of the trees must be compensated by having a greater depth given to them; but an extra foot in depth will not compensate for the loss of a foot on the surface, with the end of the spade grinding against the roots whenever they attempt to rise after the solar warmth they so much need to make the wood produce plenty of healthy blossoms. Besides, the suckers, which are such an annoyance sometimes, are mainly caused by the spade injuring the thick roots by scraping off the bark in digging. In dry porous ground there should be a greater depth of soil than where the drainage is less perfect and probably the rainfall greater. In my own mind I have not a shadow of a doubt that, rightly managed, borders for stone fruits, especially the choicer kinds, such as the Peach and the Apricot, should not

exceed 2 feet in depth. I think it is a mistake to make the borders too rich at the beginning. To begin with, they might be made with the surface soil taken some 3 or 4 inches in depth from any arable land that will produce good Wheat. Better, firmer wood will be produced in such soil than where the borders are made of chopped turf. When the trees are filling up the wall and are bearing freely, top-dressings with turfy loam will be of immense advantage, and tend to keep the roots near the surface. Turfy loam placed near the roots of exhausted trees will invigorate and repair weakened health. Where the subsoil is bad, an impervious bottom to the border, formed of 4 inches in depth of concrete, sloping down to a drain in front, will repay its cost. The borders should be allowed to settle before the trees are planted. November is the best time to plant, and the trees should be selected with care, avoiding those which have been long in the nursery and frequently cut back. The knife is a dangerous implement to use freely among Apricot trees at any stage of their existence; and it is certain that by its use many trees are debarred from a long and useful life. A young tree, budded on a weakly stock, where the action between the foster-parent and its child is not reciprocally perfect, should not be chosen. Stoutness and vigour of stem are essential to longevity. Apricots are usually budded on the Muscle, or some kind of vigorous seedling Plum; and as much care should be exercised in the selection of the stock as in that of the buds. Hereditary weakness is a forcible fact, and perpetuated in plants as it is in animals. Hence the importance of being as careful in the selection of the young trees, and noting the size of their stems, as the recruiting sergeant is in observing the chest measurement of the recruit. For a wall over 12 feet high, what are termed riders (standard trees) should be planted alternately with the dwarfs. I like to plant, first of all, about 14 feet apart, and then, as the trees require more space, replant. Trees 8 and 10 feet in diameter are always valuable, and it seems to me to be a waste of space to plant little trees at wide intervals and wait years for them to grow, when, if they were planted nearer to each other, half of them might be lifted and planted elsewhere. I wonder if any one ever had more half-specimen trees, nicely furnished, than he required? A market could always be found for them if they were not required. The best system of training, looking at the question from every point of view, is the fan shape; the main branches should be laid in at equal distances apart, leaving space for young wood to be equally distributed over the tree. It is always wise to keep the bottom of the tree in advance of the top, *i.e.* the bottom

branches should be encouraged to extend, the strength of the upward current of sap being diverted to the sides by the centre being kept open. It is not difficult to keep a fan-shaped tree well balanced if one goes the right way to work, when we master the principle that the elevation of a shoot causes the sap to flow more freely in that direction ; whilst depressing it checks the flow. Of course it may not be possible in all cases to bring down the strong and elevate the weak. Yet there are but few cases of disorganisation from loss of balance that may not be brought under that influence and the inequality rectified.

WIRING THE WALLS is, on the whole, I think, a good practice ; it saves time and material in the training of the trees, the face of the wall remains intact, and one of the customary hiding-places of insect-pests is absent, though of course insects can and do lay their eggs about the tree itself, on the axils of the buds, and in the rough bark as well as on the surface of the wall. I believe the insects select the tree because they prefer it as a winter home for their dormant progeny. The wires should be placed close to the wall, leaving space enough to get the ties behind, but no more, which need not exceed the eighth of an inch. Complaints have arisen as regards the use of galvanised wire for this purpose, but, though I have used it in various ways, I have never in my own practice seen any injury arise from its use. Still, there is no doubt the bark of the young growth of Peach and other fruit trees has been injured by contact with it. There is no means known to me by which any person can say, by an examination of its surface, or the application of any known test, that a certain sample of wire will damage young wood. And yet one would think science ought to tell us which is injurious and which not—assuming, of course, that the fault lies in the wire, which is not yet ascertained. Wherever the bark of fruit or other trees is damaged by contact with galvanised wire, the wire should be painted, and its injurious tendency will be at once removed.

SUMMER MANAGEMENT OF APRICOTS.—This will commence in April with the disbudding. Many do not disbud Apricots. They simply allow all the breast wood to grow till June, and prune it back to three or four buds or leaves, which are left to form spurs to bear fruit or not, according to circumstances, the following year. These influential circumstances to which I have just alluded may be summed up in two words—viz. mature wood ; that, again, may be still further explained by the words air, water, and sunshine. I want to make it as plain as I can that a tree thinly trained and properly summer-pruned will have an abun-

dance of air ; the only other thing stipulated for is water, which should be given copiously in spring and summer if the weather is dry. If the fruit is to be taken from young wood, the disbudder must take note of it, and leave healthy shoots to fill up the vacant spaces on the walls. Disbudding is an operation easy enough to the experienced practical man, because he knows what he wants and the best and more direct way to obtain it ; but the mind of the tyro is often painfully exercised in the selection of the buds which are to remain. A trained eye and hand grasps the situation at once, takes stock of the wall space to be covered, and leaves a certain number of young shoots to fill up the space, the remainder—except the leader—to be gradually removed. The majority of cultivators take the shoots from the upper and lower sides of the main shoots indiscriminately, wherever the best eye can be obtained, but there is some advantage in working on the Hamiltonian system, which is briefly this : All the bearing shoots spring from and are trained on the upper side of the main branches. This is simple enough, and all the disbudder has to do is to select the best bud he can find at the bottom of each bearing branch on the upper side, and gradually remove all the others except the leader. The chief advantage of this system lies in its clearness and simplicity, and there is less margin left for a blunderer to make mistakes. Very few cultivators disbud Apricots and Plums on the same lines laid down for the Peach, though they would succeed if so treated. The usual plan is to go over the trees when they break, and rub off a few buds where they are too crowded, taking of course the weakest. As the season advances and the young wood has made, say, six leaves, all the shoots except those required for filling up vacancies on the walls should be pinched back to three leaves ; and all lateral growth during the season must be pinched back to one leaf. The young shoots should be nailed in or secured to the wall in some other way to keep them safe from wind.

THINNING THE FRUIT.—In good seasons when all the blossoms set there would be too heavy a load for the tree to bear, no matter how well it may be fed. I have proved often enough that if we mulch and water with liquid manure from the stoning period onward till the fruit begins to ripen, a tree in good health will carry an immense load ; but a tree, unaided, can only carry a limited weight of fruit ; and if too many apricots are left on they must of course be small. If the tree's powers are unduly exhausted the branches may die off from debility, or its health and vigour may suffer in other ways. Assuming that a fruit tree—an Apricot for instance—can only carry safely a given weight of

fruit, is it not more profitable to have that weight in a smaller number than in a large one? It will be seen from what I have written that no rule can, or should be, laid down. The load must be proportionate to the strength of the tree and the amount of assistance which can be given it. The best form for that assistance to assume is in

MULCHING AND WATERING.—The mulch should consist of half-decayed manure, be allowed to cover a large portion of the space occupied by the roots, and placed on 3 inches thick. The keystone of the culture of stone fruits (and for that matter all other fruits) is in enticing the roots to come up near the surface, and by judicious feeding to keep them there. It is only in this way that thick, strong, dark-green foliage, capable of nourishing stout, plump, fertile buds, can be had, and then there will be but little superfluous growth, as all the wood made will be full of blossom buds, and any tree which carries its rightful load of fruit does not get out of hand and run wild. The mulching should not be put on before it is needed, as we do not want to keep out the sun's warmth and the warm air till the weather becomes settled, say in June. The beginning of the month will be the time in the average of seasons, and it should be removed again as soon as the fruits are ripe, so as, by the end of August, to let in the sunshine to warm the roots, which will have a maturing influence upon the buds and foliage.

WINTER PRUNING.—This should be delayed in the case of the Apricot and Peach till the sap is on the move, to show where the blossom buds are; and in the pruning operations the crop can, as far as possible, be left in a position to receive all the shelter from the wall which it is capable of giving. In training the branches great care should be taken that no injury is done to the bark, to lay the foundation for canker and gumming. The ties and shreds should be loosely arranged, to leave room for the branches to swell. Young hands very often, for want of thinking, make mistakes that produce serious mischief. Apricots, if well attended to in summer, do not need much winter pruning; in fact the less the knife is used at that season the better. As regards aspect, they succeed very well on east or west walls in the Southern counties, and also in the Midlands; but in the North they should be planted on the south wall, to ensure the wood being well ripened in autumn.

PROTECTING THE BLOSSOMS.—Apricots flower earlier than other fruits, and the blossoms are very tender—more so than the Peach. No one who wishes to secure a crop (and I suppose all wish that) will leave the trees exposed. I have tried a good many

ways of affording protection, and, after securing a good coping, I have finally come back to the old-fashioned system of Yew branches and fishing-nets. I find in these simple inexpensive materials protection enough to save the crop without weakening the trees by overdoing it. I never cover before the blossoms begin to open, and I do not altogether uncover till the middle of May—even not then if the nights are cold and frosty. The Yew branches are cut small, and tucked under the branches of the trees in such a manner that they will afford protection to the blossoms; the fishing-nets, in one or two thicknesses, as may be needful, are suspended in front, and secured to prevent the wind doing injury to the trees.

THE PROPAGATION OF THE APRICOT is very easy. Many of the Apricots on cottage walls have been raised from seed by some of the children planting a stone. Seedlings vary a good deal, and some may be useless; but I have seen many raised from the Moor Park which have turned out well, and, unlike the Peach, seedling Apricots are healthy and vigorous on their own roots, and if planted in firm ground soon come into bearing. The system adopted in the nursery is to bud Apricots on the Muscle Plum. The operation of budding is very simple, but some judgment is required both in the time and method of selection. As regards the latter, when the bark works freely and the buds can be had in the right condition, there is not much fear of failure. From the end of July to the end of August is the best time to bud fruits of all kinds. Insert the buds in the side of the stem near the ground, on the western or north-western side, as in this position they may be shaded a little from the sun. The tie should be loosened as soon as the bud is fairly established.

INSECTS AND DISEASES.—Apricots are sometimes attacked by aphid and red spider, but they are easily freed from these pests by using the usual remedies, which have been elsewhere referred to. A species of brown scale sometimes establishes itself on Apricot trees. It usually appears on those in weak health, and can easily be got rid of by using a strong wash of Gishurst compound in winter, 5 or 6 ounces to the gallon of water. It may in bad cases be thickened with lime, soot, and sulphur, adding a dash of Tobacco liquor to the mass, stirring it till it assumes the consistency of paint; then it can be applied with a painter's brush in winter, when the leaves are down and before the buds start. The diseases which do so much injury to Apricots on some soils are gumming and canker, or branch-dying. In the latter respect the Apricot is singularly unfortunate. No other fruit tree is so.

and the cause has been a puzzle for many years. The old horticultural writers, Loudon, Nicol, and Forsythe, are silent on the matter, perhaps through not observing it, or because it did not occur in so pronounced a form as now. When a large branch—in some cases half a tree—dies suddenly there must be a cause. The worst cases coming under my own observation were trees which in early life had made very rapid progress. They had been planted in borders newly made of turfy loam, and the growth had been luxuriant; but as soon as the wall was nicely covered the branches began to die and had to be removed, and at last the trees became such an eyesore as to render a fresh start necessary. I think one source of the mischief was overfeeding when young. Apricots do not require a rich soil, but it should contain plenty of lime and be kept in a firm condition. When the trees have made some growth and begin to bear, it is an easy matter to feed with liquid manure in proportion to the load they are carrying. Borders made of chopped turf are elastic and light, and for a few years, from the decay of the fibre which they contain, are rather too rich for Apricots. When the fibre is all decayed the rapidly-extending tree is brought to a sudden stop, perhaps just at the time it needs extra help, in consequence of being heavily laden with fruit. The sudden check causes a sort of paralysis in the tree's system, which it revenges by suddenly casting off one or more branches. Make the borders with fresh soil from the top of some arable field, over a limestone bed, if it can be had, and give the turfy loam when the trees begin to bear and need extra help; by working it into the border the roots will be sure to find it. Gumming very often arises through injury to a branch or stem in the pruning or training, and special care should be used in this work. The injury causes a wound; this forms a receptacle or base for a fungus growth, which produces the gum. The remedy is to prune away the diseased part, and cover the place with grafting wax or clay, to which some lime and cow dung have been added, or cover with tar. This is intended to keep out the air until new bark can be formed.

VARIETIES.—Moor Park, Breda, D'Alsace, Hemskirk, Kaisha, Peach Apricot. Taken altogether, the Moor Park is the best variety, and, if planted in soil of a suitable character to make wood of moderate strength which would ripen well, to counteract its habit of branch-dying, would be unapproachable. Even as it is, I suppose there are half a dozen trees of this variety planted to one of other kinds.

CHAPTER VII

The Cherry.—Kent is undoubtedly the home of the Cherry and the Nut, but the Hazel Nut and the wild Cherry flourish wherever the soil is dry and good, a fertile loam of some depth overlying clay being the best. I have seen healthy and fertile Cherry trees growing over the red-sandstone formation; and, so far as garden culture is concerned, any fairly good well-drained land will do. The blossoms of Cherries are specially liable to be cut off by spring frosts, and therefore shelter is a matter that should not be neglected. The trees must not be planted in a low-lying situation, as the shelter so obtained from winds will lead to greater damage from the frost, and it is well known that such positions very frequently prove fatal.

AS A STANDARD on Grass the Cherry is a very profitable tree, but the orchard should not be laid down till the trees are well established and in a free-bearing condition, say from six to ten years after planting. Like the Plum, the Cherry soon begins to bear, as every matured bud will produce fertile blossoms. It is not judicious to overcrowd the trees, as where this is done they lose that beautiful round head which, when loaded with blossom in spring or with fruit in summer, has such an ornamental appearance. From 20 to 25 feet in orchard planting will not be too far apart. The land might carry a crop of Black Currants the first ten years, and then be laid down to Grass. Such an orchard would, I have no doubt, pay well. A handsome Standard Cherry tree will be no mean ornament in any conspicuous position in the Villa Garden. There are many trees planted for ornament lacking its beauty, without taking into account its utility as a fruit-bearer. The Cherry dislikes the knife on account of its predisposition to gumming and canker. On some soils this tendency is more apparent than on others. The matter should be observed closely, and where the soil approaches heaviness the knife should be used sparingly, if at all. Standards, after they commence bearing, will require but little pruning, as the crop of fruit which is annually borne in favourable situations will check over-luxuriance. At the same time the trees should be looked over every year, and if any thinning is needed it should be done.

CHERRIES ON WALLS.—To prolong the season and obtain early and late fruit, and for their protection, wherever there is a walled-in garden, a certain proportion of the wall surface will be planted with Cherries. The May Duke, for instance, on a south or east

wall will ripen its fruit early, and a dish of well-ripened Cherries is always a welcome addition to the dessert. The Morello Cherry, again, on the north side of the wall, may be kept in good condition till October, and at that season used in the dessert, though it is more thought of when preserved in brandy. The Cherry submits readily to training. To cover a high wall quickly there is no better way than planting Palmettes 7 or 9 feet apart. The fan system also succeeds well, but the less the knife is used the better, for wounds or injuries of all kinds are just so many openings for gumming. If the cuts could be dressed with Stockholm tar or painters' knotting, or even a little cement rubbed into the wound to close up the lacerated cells, it would, by keeping out air, encourage healing.

PRUNING CHERRIES.—The safest time to prune Cherries is in summer, and all pruning, as far as possible, should be done at that season, cutting the young foreright shoots back to three buds or leaves, and laying in a young shoot wherever there is space to fill up. It is very essential, to keep up the vigour and bearing capacities of the tree, to lay in young shoots occasionally. Cherries on the spur system are constantly getting farther from the wall, and the old spurs become a receptacle for canker.

RENOVATING OLD TREES.—I have seen all the old spurs cut off, the wounds dressed with some impervious substance, doing the work in March, thinning out the young shoots which started freely, and laying in those reserved at full length without any shortening; the wood ripened well, and bore wonderfully the next season, the fruit being very fine. This system in the case of old trees may be adopted and continued with profit. Of course after the first season only a limited number of the shoots will be removed annually, their places being filled with others of the new growths. The Morello Cherry is always treated in this manner, only thinning the young shoots in summer so as to ensure the thorough maturation of those left for the following year's crop. Overcrowding of the branches is one of the greatest evils of fruit culture, especially with such trees as Morello Cherries and Peaches.

BUSH CHERRIES.—These are usually budded on the Mahaleb stock, and in some situations succeed very well. It is a system better adapted to the early and late Dukes than others, such as the Bigarreaus. These later varieties do not like a dwarfing system; they succeed best when permitted to strike out with but little knife work. The Morello succeeds very well on the Mahaleb, being lifted occasionally to check over-luxuriance, should any manifest itself. Heavy clay soils require a good deal of lightening before Cherries are planted. The best way of doing this is to burn

some of the clay early in spring after it has been exposed to the drying influence of March winds. This treatment will improve heavy land for all cultural purposes besides fruit-growing. I think I need not say more about pruning and training, further than that care should be exercised not to prune more than is necessary, or use more nails or ties than a bare sufficiency to keep the branches in order and steady. There is frequently a lot of time and material wasted in training fruit trees. Just as many attachments should be used as are needed to keep the branches out straight and no more, and plenty of room between the branches and the ligature should be left to allow for swelling.

PROPAGATING CHERRY TREES.—I have an acquaintance, a working man, who has a garden in which he takes great interest, and he has often amused himself in planting fruit-tree seeds, such as Cherries, Plums, etc. He has raised a lot of Cherries, which are now in full bearing, healthy, and strong. So far as I have seen, he has nothing better than the old-established kinds, but I somehow think there seems more than the average vigour in them, which some might think arose from their being seedlings unworked. But whether it is so or not, I can recommend all who have a garden to plant a few seeds of fruit trees, taking pains, of course, to obtain the seeds from the best-flavoured fruit. As soon as the seedlings appear (unless it be intended to bud established kinds upon them) they may be led up in a single stem to form standards. They may stand rather close to each other till they bear, when they should be planted out finally if the fruit is of average quality. If the young tree has gone back to its wild condition, then it may be budded when strong enough in August. It will thus be seen that raising seedling fruits, such as Cherries, Plums, Apples, and Pears, will, if it does nothing else, give us a lot of young healthy stocks for working established kinds upon. If followed intelligently and persistently it will do something more; besides being a constant source of interest, it may lead to the production of varieties worth perpetuating. At any rate it cannot be a loss to us, but may be a great gain.

WATERING AND MULCHING.—In dry weather the bulk and weight of the crop will be much increased by a few good soakings of liquid manure during the swelling of the fruit. I remember some years ago a very large old Waterloo Cherry tree standing on Grass, that was watered regularly in dry summers from a rivulet near, and it was wonderful how rapidly the Cherries grew under the combined influences of moisture and sunshine. It is not well to pick off stones from land to be planted with Cherries. Stones serve a wise purpose in more ways than one. They are conser-

vators of moisture, and also tend to keep the soil open and assist the natural drainage.

BUSH CHERRIES IN POTS.—A few early dishes may generally be obtained in this way if there is a cool glasshouse to shelter them when in flower, in the same way as I have recommended for Plums; in fact the same treatment that suits one will do for the other. The May Duke is the earliest for this purpose, but others, such as Governor Wood, are good. The soil should be firmly pressed or rammed in the pot, as all stone fruit succeed best in a firm root-run.

SHELTERING THE BLOSSOMS.—The Cherry expands its flowers about the same time as the Plum, and though in the case of large orchard trees protection is out of the question, yet wall trees may be easily protected in the same way as I have recommended for Plums—with fishing-nets. Small bush Cherries may be protected by having sprays of Yew tree tied among the branches. Flimsy materials have a great protective power in warding off spring frosts. The ripe fruits must be protected from birds, blackbirds being especially troublesome.

INSECTS AND DISEASES.—The black-fly or aphid is the most troublesome insect infesting the Cherry, and if it makes its appearance it should be attacked at once and no quarter given. The black-fly is more difficult to kill than any other species, but it always succumbs to Tobacco, either in the shape of powder dusted among the infested leaves or as a wash. A solution of soft soap, Gishurst compound the same, and an infusion of Quassia chips, are all useful. Soap suds from the laundry may be used, as they have a great cleansing power; and where insects congregate the trees soon get filthy.

Gumming is the worst and most troublesome disease attacking stone fruits, the Cherry on some soils suffering much from it. Its effect is most frequently seen on heavy cold lands. The best remedy is to cut away all infected places and dress the wounds with Stockholm tar. Gumming, like canker, is seldom troublesome to trees in a healthy thriving condition with roots near the surface. Therefore, in our efforts to arrest gumming, we must first ascertain the cause, and if the trees are made more susceptible by deep rooting in a bad subsoil, which is commonly the case, the roots must be lifted and placed under more favourable conditions; then measures should be taken by cutting away the affected part and dressing the wounds with something that will keep out air and destroy all fungoid growths.

VARIETIES.—Early Purple Gean, Elton, Governor Wood, May Duke, Late Duke, Royal Duke, Knight's Early Black, Bigarreau,

Napoleon, Waterloo, Black Eagle, Kentish, and Morello. Many of the above are adapted for orchard planting.

CHAPTER VIII

The Fig.—The counties bordering on the southern coast are all well adapted for the open-air culture of the Fig. There, aspect or soil is a matter to which but little consideration need be given, as the Fig thrives with its roots running down into the blue gault of Sussex as well as on the lighter strata overlying the chalk. In the Midland counties, and most other districts of England, good Figs may be had by adopting the proper system of culture. I have had as good Figs in the Midlands as I used to gather twenty-five years ago in Sussex, and their value in August and September is very considerable as an addition to the dessert.

PREPARING THE BORDER.—The border must have a good aspect, a full southern exposure being necessary. A warm corner, where a southern and eastern wall meet and form an angle, will do, part of the tree or trees being trained on both walls. Though aspect has much to do with success, it is not everything, the formation and composition of the border being of equal if not greater importance. The depth of soil need not be great, never more than 2 feet, and in low damp places 18 inches, raised a little above the surface, will be enough. The bottom should be dry—this is imperative; a concrete foundation, sloping to the front, being desirable for at least 4 to 5 feet in width. The soil should be a sound loam of medium character, to which crushed bones and some old mortar is added. No other manure need be mixed with the soil. The proportion of the bones may be 1 cwt. to a ton of loam, or, say, 1 in 20 parts. The borders need not be very wide—6 feet will be ample at first. More may be given as time passes, but the secret of success in Fig culture is in never losing touch of or control over the roots. The borders may be made in February or March, and the plants obtained and set out in April or May, when all danger of frost is past. Plant at first about 12 feet apart, and rearrange afterwards, as the plants require more space. Make the soil firm about the roots, mulch to keep the border moist, and encourage the roots to keep near the surface.

TRAINING.—Few follow any given system very rigidly; the fan merging into the horizontal is a good one, and often adopted. The horizontal, pure and simple, inasmuch as it keeps the branches thin on the wall, is to be commended; but it does not seem natural to the Fig, and is not generally employed, still it possesses advan-

tages. More often the Fig is trained in a haphazard kind of way, with the view of covering the wall quickly. Very frequently the branches are trained vertically. This leads to the bottom of the wall being denuded of all fruiting wood, and much space is wasted. Whatever system of training is adopted the branches must be trained thinly, not less than a foot apart, so that the warmth of the sun can strike the wall between the leaves and ripen fruit and wood, for the sun is just as necessary to one as the other. Disbudding should be done early, and all shoots not required should be rubbed off when small. This is very necessary, more so north of London than south of that point. The young shoots left should be laid-in full length unstopped, as in outdoor culture stopping is of no advantage. As the fruit advances towards ripening, liquid manures should be given to impart increased size, and the roots should be mulched with manure with the same object of giving support at the moment needed. This is much better than making the border of richer materials, wherein lies the danger of encouraging grossness of habit. All fruit on the young wood that has attained the size of a Hazel Nut in September should be rubbed off, as it generally fails to grow in spring, and only uselessly exhausts the trees. The small fruits just visible in the bud or embryo state are the most valuable for next year's crop.

PROTECTING IN WINTER.—Before severe frost comes the branches should be unfastened from the wall, drawn together, and covered with dry straw, securing it with strands of strong matting or tar-line. In this condition they will remain till April, when, all danger having passed away, the coverings may be taken off towards the end of the month, and after a few days' exposure what pruning is required should be done.

PRUNING.—As regards pruning, the young wood being thinned out well in summer, there will be little to do beyond cutting back dead shoots, or an occasional removal of a large branch which has become naked at the bottom with the view of letting in a young shoot to take its place. This will be necessary to a certain extent annually, for without it there would be a difficulty in keeping all parts of the wall furnished with bearing wood, as the Fig bears only on the young wood of the previous year; and in order to keep up a constant supply of young fertile wood without overcrowding, we must annually cut out a branch here and there to open up the tree, and make space to lay in young wood. In carrying this out the pruner endeavours to cut away only such branches as are by reason of their nakedness in a barren condition. In this way a constant renewal of fertility is assured without any such drastic measure as heading back.

TRANSPLANTING.—Figs of any age and size may be moved, if done carefully, without sacrificing a crop, April being the best month for the work. Trees making gross, unfertile wood may have their roots lifted then and brought near the surface, using the compost recommended in what I have said on the preparation of the borders. It may be advisable in transplanting or lifting large old trees, involving some sacrifice of the roots, to prune the branches rather severely for the special purpose of making openings for laying in the new short-jointed wood which will result from placing the roots under better conditions.

WATERING.—In dry weather this will be necessary in hot summers when the fruits are swelling rapidly, and, as I have already hinted, liquid manure and mulching will be of advantage. The young wood should be nailed in close to the wall as it progresses to keep it from shading the swelling, ripening fruits, and also to facilitate the ripening of the wood by bringing it into contact with the warm face of the wall.

PROPAGATION.—Though Figs may be raised from seeds, layers, suckers, and cuttings, the best way of increasing established kinds is by cuttings of ripened young wood taken off with a heel of that which is older. These may be from 8 to 10 inches long, and should be planted firmly in sandy loam under a handlight, where during the winter protection can be given. A better plan would be to plant the cuttings in pots and place in the greenhouse or a vinery, or some such place. The cuttings should be taken as soon as the leaves fall in autumn. They will make nice little well-rooted plants in a year. Figs are often propagated by layers, *i.e.* by bringing some of the branches down to the ground, and, after notching them near a joint, pegging them into the soil or heaping it over them, in which position they must remain till rooted. Raising Figs from seeds is not much practised, as the seedlings vary a good deal in character. Plants obtained from suckers are not equal to those from cuttings or layers, being much longer in coming into bearing, and never altogether losing that gross unfertile habit which is attached to their nature. Cuttings taken from a fruiting part of a tree are always better than if taken from the roots.

VARIETIES.—The best varieties for open-air culture are Brown Turkey, a very abundant bearer, the tree being hardy and healthy, and also good under glass, forcing well; Brunswick, perhaps a trifle less prolific than the preceding, but yet an excellent Fig; White Marseilles, a round fruit of good quality.

CHAPTER IX

The Grape Vine in the Open Air.—Though the late bad seasons have created in some minds a doubt about open-air Grapes ever again ripening in our climate, yet even in the year 1881 White Muscadine Grapes ripened well on the south front of a cottage near Ramsey, Hunts, and in 1880 I was driving through Woodhurst, a village in the same county, on the 14th of October, and the front of nearly every cottage on the south side of the village-street was covered with Grape Vines loaded with fruit—both bunches and berries being of good size, the black Grapes being well coloured. It was evident that in the majority of instances there had not been much pains taken with the borders; for in many cases not more than a couple of feet separated them from the hard roadway, which was composed of broken granite. Into this hard mass the roots must have gone if they went anywhere outside the narrow border which generally skirted the front of the cottages. I have seen elsewhere Grape Vines flourishing better and bearing finer fruit, with the roots seemingly in a hard road or garden path, than when laid in a deep porous border. What the Grape Vine requires is an even, regular state of moisture and temperature. This even condition is found in or beneath the hard roadway. In the majority of made borders they are either made too rich by the use of manures, and so become sour and pasty, and the Vines fall a prey to mildew, or else they are made so loose and porous that if the waterpot is withheld the Vines are starved and the fruit useless. The truth is, that scarcely any one waters a Grape Vine on the wall sufficiently if the border has any drainage under it. Plants carrying such large foliage in hot weather must dissipate a lot of water, and if not supplied from one source they seek it from another, where it is not so well adapted for the work in hand. Besides, if the supply of water should fall off, there is less work done, for new wood, foliage, and fruit cannot be made without moisture, of which, indeed, it forms the chief part.

THE BORDER must have a dry bottom, for though occasionally we read of Vines with the extremities of their roots in close proximity to some rivulet, water-course, or drain, yet it is certain that, if the water encroaches upon the border where the main roots are situated, the Vine will not succeed. It is true, however, no matter how unfavourably situated the Vine may be, that it seldom dies right out. If mismanaged it revenges itself upon us by becoming a prey to mildew and getting out of hand in other respects, but

it clings to life with a tenacity rarely found in other trees or plants. A plant so easily propagated, and whose management is so simple, and which, moreover, is of such an undying nature, ought not to be difficult to cultivate and make fruitful; nor is it. It must have a good aspect—south or south-east is the best; and with a well-drained border, composed of sound loam, neither light nor heavy, mixed with some crushed chalk or limestone and a few bones, it will, if well supplied with water in summer, do well. Some people have a notion of picking out every little stone from beds and borders. This is, I think, a mistake. They need not of course be raked on the top and left there, as it is not difficult to bury any which may come to the surface. Where the subsoil is bad the bottom should be made impervious for 4 or 5 feet from the wall. In damp soils a drain should run along the front of the border, and a little below it. The best time to make new borders, or repair or renew old ones, is in March or September. The Vines, if young ones are to be used, may be planted any time in spring—preferably in April, about the middle of the month, the plants having been kept cool all the winter. The roots should be uncoiled and laid out straight, about 8 inches from the surface of the border. It would be impossible, according to my view of the matter, to overrate the importance of having the roots near the surface. The border may be of a depth to suit the district, the soil, and the cultivator's capacity and time, for these are more or less factors in the matter; but by far the majority of the Vines in the country are planted without any preparation being made. Occasionally, under favourable conditions, by a lucky hit as it were, they succeed; but given a warm site, a properly-made border, a good supply of water in dry weather, and proper management of the growth in summer, success ought to be a matter of certainty.

TRAINING.—Assuming the young plants are turned out in the border when the soil is in a nice condition to receive the roots, all the buds but three should be rubbed off, and those three should be near the bottom. They should be trained to the wall when they need support, the centre shoot being taken straight up, and the side shoots led off a short distance at right angles and then trained vertically. The shoots should be stopped if vigorous when they have grown about 5 feet, to strengthen the bottom eyes; but the next break should form a leader, and be laid in. Young Vines want a good deal of water, and the border should be mulched 3 inches deep with manure.

SUMMER PRUNING.—If neglected, Vine shoots soon get into a tangle by reason of their hooklike tendrils getting hold of each other and clinging with a tenacity which makes separation very

difficult without some parts suffering injury. Hence the value and importance of work done at its proper season. As soon as the buds burst forth the weak ones should be rubbed off, and as soon as the bunches can be seen a further reduction in their number should be made, leaving only as many as can be laid in to the wall without overcrowding. Stop all shoots one leaf beyond the bunch, and rub off all lateral growth in the bud state. This may be taken as a general principle in the open-air cultivation of the Vine; but there may be cases in which a departure from this principle is advisable in the matter of stopping the main shoots. For instance, a little more growth may be permitted, say to two leaves beyond the bunch, before stopping, and there may be cases where the lateral growth may have a little more freedom. These cases are usually Vines in sluggish action, and a little more growth acts as a stimulus to exertion.

WINTER PRUNING.—This should be done as soon as the leaves fall; and any dressing or cleaning which may be necessary should be done at the same time. The best system to keep the Vines in a continuous bearing state is a combination of spur and long rod. For instance, a certain number of old rods should be cut out annually, and a similar number of young canes trained up to supply their places. In this way there would never be any old rods with long spurs producing a thicket of weakly sprays which are comparatively worthless. When the Vine wall is first planted it will be best to plant at a certain specified distance apart, say from 8 to 12 feet, with main rods starting away horizontally at right angles from the trunk till the limit of width has been reached, and then led upwards. Other canes would spring from the base, and be trained 2 feet apart, vertically. The bearing rods would be 2 feet apart, or in some cases a little more space should be allowed, and between each two bearing rods will be trained a young rod, growing up for bearing the next year. In shortening these young shoots, cut to well-ripened wood. The spurs also should be cut well back, for there is no advantage in leaving them so long as is commonly done. It is always a good plan in the management of Vines—and indeed the same rule applies to all fruit trees—to allow those trees showing superior vigour to extend at the expense of the plants growing near. If we plant on a south wall a dozen, or any greater or lesser number of Grape Vines, some of them will be sure to be stronger than the others; and unless they are of different kinds, and there is some special reason for permitting all to remain, the strongest should be allowed to occupy all the space, removing the weakly plants. There are two great evils in connection with open-air Grape culture—one is the

delay and frequent neglect in giving attention to the regulation of the growth in spring and summer, and the other is over-cropping ; while no effort is made by giving the plants extra sustenance, in the shape of mulching or artificial manures, to enable them to swell their fruit off to a profitable size. No spur should be permitted to carry more than one good-sized bunch, and, if time permitted, in the case of the best bunches thin the berries with the scissors. I am convinced that if this were done the Grapes would be of a much better quality. So far as regards wine-making, the Grapes need not be thinned ; and if the Vines were well fed, to ward off undue exhaustion, more bunches might be left on than if the Grapes were required for dessert. Grapes good enough for dessert were grown in this country when more care and attention were bestowed upon their culture, and I have no doubt this will be done again when a greater number of people, with original methods of propagation, are induced to take up the subject.

RENOVATING OLD VINES.—Old exhausted Vines may be quickly brought back to a profitable condition by root lifting, and adding fresh turfy soil to the borders. No fruit tree responds so readily to good treatment as the Vine does. The proper course to adopt is to open a trench along the front of the border, taking away all exhausted soil, lifting the roots out carefully, bringing back fresh soil, and after pruning the roots laying them out evenly and straight in the border, about 8 or 9 inches from the surface, mulching the border with 4 inches of good yard manure. At the same time the knife should be used freely among the branches to make room to lay in a supply of new wood, which, with roots brought near the surface, will be short-jointed and firm, every eye or bud showing a bunch of Grapes. The best time to do this work is when the leaves are ripe, or have finished their work in autumn. The mulching and watering in dry weather are very important, as this brings the roots near the surface and keeps them there.

DISEASES, ETC.—Mildew is the only really troublesome enemy to the Grape Vine in the open air, and this is mainly caused by sluggish root-action, arising chiefly from two opposite causes—viz. a wet, cold, pasty border, or extreme dryness at the root. Lifting the roots in the way suggested will be an effective remedy in the former case, and a dressing of artificial manure, with a substantial mulching and plenty of water, will give the much-needed nourishment when drought is the cause. When an attack of mildew is brought on by ungenial weather, inducing a sudden check, washing with sulphur water, or dusting dry sulphur over the affected parts, will quickly destroy the pest ; but there must be no delay in applying this remedy.

PROPAGATION.—Cuttings and layers are the best methods of raising young Vines, and their propagation by single eyes is of course a form of striking them from cuttings. In raising them from layers the stems should be split, or a notch cut just beneath a bud, for the purpose of arresting the sap at this particular point, where it soon forms into granular matter, from which roots quickly issue. The autumn is the best season for layering, and toward the end of the month of September or beginning of October the work may be done, pressing the soil about their stems. Cuttings 7 or 8 inches long, taken off if possible with a heel of old wood, planting them firmly in the border near the wall, at the right distances apart, which may be eight or more feet, or even nearer if the wall is required to be covered soon. Single eyes may be cut from well-ripened wood, with a shield of wood at the back of the bud an inch or so long. Pieces of tough sod or turf 5 or 6 inches square may be prepared from a Grass field or common. A little soil should be scooped out of the centre of each, one eye pressed into it, and a little light, rich soil pressed firmly round it; and the sod may be started with a little warmth in a frame or pit, or a close frame without artificial heat might do. When the plants have made some progress place a stake to each, and as the season advances, and the weather becomes more settled, plant out, setting the piece of turf in the hole carefully without disturbing the roots. Water must be given to cause the young plants to begin growth at once, without let or hindrance.

VARIETIES.—Black Cluster, Esperione, Muscat Lierval, Muscat St. Laurent, Royal Muscadine, Ingram's Hardy Prolific Muscat, Sweetwater.

CHAPTER X

Walnuts and Chestnuts.—Apart from the value of their fruit, which, in a good season, is considerable, these trees are very effective in the home landscape and grow into valuable timber. No greater inducements than those can be offered to a planter, and I am rather surprised that planting is not more frequent.

WALNUTS suffer much from late frosts, and often the crop is ruined from this cause, especially in low-lying situations; hence, when grown chiefly for their fruit, rather an elevated, but, at the same time, a somewhat sheltered site should be chosen.

PROPAGATION.—Walnuts are generally raised from seeds, though, like most other fruits, the seedlings vary in character a little. In making a plantation for fruit bearing, it is better to plant about

10 or 12 feet apart, and when they come into bearing cut out the inferior varieties ; this will give those left ample space, and retain the best Nut-bearing trees. The Nuts for raising young trees may be planted any time between their full maturity and the end of February. Plant in drills 18 inches apart and 3 inches in depth. If the mice are troublesome lay slates, tiles, or boards along the rows, or cover the surface over the Nuts with sifted coal-ashes. If the young plants make good progress the strongest may be transplanted at the end of the first year, but they will take no harm if they stand two years. When set out in nursery rows they should have plenty of space, the rows to be not less than 3 feet apart, and 18 inches apart in the rows, in order to obtain handsome well-balanced plants.

TRAINING AND PRUNING.—The young trees should be trained up with a single stem, eight or more feet high, removing all side branches as they appear. As a rule, the more all fruit-bearing trees are lifted and transplanted in their youth the better it will be for them ; therefore young Walnut trees should not stand more than two years without being lifted, till they are finally planted, and even then, if we think they are not bearing early enough, we can always hurry them on by lifting ; or, if the trees are too large for that, digging a deep trench round, and lifting up the roots, will bring them into bearing.

All pruning should be carefully done, the branches (which should as far as possible be taken off when young) should be cut close to the main stem, and the wound made smooth. If dressed with Stockholm tar the air will be kept out, and the formation of bark over its surface facilitated.

If Walnut trees are grown together in a plantation, or to form an avenue, they may stand from 45 to 50 feet apart. Where only a tree or two are planted, they may occupy a prominent position, from which a pleasant view can be obtained, and where in after years, when the tree affords shade, a seat may be placed in summer. There is something about the atmosphere surrounding a Walnut tree which insects, especially gnats and flies, do not like ; and it is delightful to find a quiet situation on a summer's evening, to enjoy a book or to think, unmolested by the pests of the insect world.

GATHERING THE NUTS.—Those required for pickling should be gathered before the shell has begun to form. In most places this will generally be about the middle or end of July, but the remainder of the crop should be left on the trees till the Nuts are ripe and begin to drop of their own accord ; they should then be bashed off, dried in an open airy place for a few days, and packed in jars or casks in dry sand. The sand must be really dry, or the Nuts will

become mouldy. In packing, place the Nuts in layers, with dry sand in between. If too much sand is used the kernels may shrivel; and in case they do, steep them in milk, to which a little water has been added, for seven or eight hours, which will restore them to good condition again. This, of course, should be done just before they are required for use. Everybody, I suppose, is familiar with the old couplet—

“A woman, a dog, and a walnut tree,
The more they are beat, the better they’ll be;”

and many people have an idea that, as regards the Walnut tree, there is some truth in the lines. Hence it is said that if we want plenty of nuts, we must bash the trees.

THE SWEET OR SPANISH CHESTNUT.—Few trees are superior to this for nobility of aspect; and yet, strange to say, it is seldom planted in the grounds of the villa garden. This is, I think, a great loss. It has grand foliage, a stately habit of growth, and, when in flower or fruit, possesses a distinct character, unlike all other trees. There is a nobility in its appearance even, when leafless in winter, which is not surpassed by any other deciduous tree. I do not say much about its fruit, for, except in favourable situations, the crop cannot be relied on to ripen. Yet I can remember good crops of Chestnuts being gathered in the Midland counties not so many years ago, and probably this will be again when the long warm summers come back to us. A grove or an avenue of Chestnuts will be fitting tree furniture for any situation where there is scope. There is no difficulty in their propagation; they are reared from seeds. The best time to sow the Nuts is shortly after Christmas, when the weather is suitable and the soil in good working condition. Sow in drills 18 inches apart, and cover them about 2 inches deep. At the end of the second year transplant into nursery rows 2 feet apart and 6 inches from plant to plant. In this position they may remain two years, receiving the necessary training and pruning to secure straight stems and evenly-balanced growth; when strong enough, plant out finally. To obtain a long straight shoot, 6 or 7 feet high, in one season, cut down the plants to two eyes. The strongest will break away, take the lead, and make a long straight main trunk, which will add value to the tree in after years.

COB NUTS AND FILBERTS.—The Kentish system of managing and pruning Nut bushes is the most profitable one. There they are kept as low wide-spreading bushes, hollowed out in the centre like a large edition of a well-managed Gooseberry bush; and the same treatment that converts the Gooseberry (which is not naturally a spreading open-centred bush) into the evenly-balanced

free-bearing bushes commonly met with, will do the same for the Nut. We start with a young plant, and cut out the branches springing from the centre vertically, at the same time regulating those surrounding the main central stem. In the case of the Filbert or Cob Nut, bushes 10 or more feet in diameter are formed in a comparatively short time, and these low wide-spreading bushes, being full of small spray, from their exposure on all sides to air and sunshine, produce an immense number of blossoms, and carry heavy crops of Nuts. Any one who can by pruning secure an evenly-balanced open-centred Gooseberry bush can as easily carry out the same system with the Filbert or Nut, for in both cases the principle of action is the same—only the Nuts should not be spurred in, as is sometimes done with the Gooseberry. In the Nut we must aim at obtaining an abundance of feathery spray. This is best done by occasionally cutting back a branch to obtain a new break, and by keeping the branches thin. The pruning must be done annually. All suckers or sucker-like shoots springing from the base or the main stems must be removed. This is commonly done, not by cutting out with the knife, but by twisting them out with a sudden movement of the hand. Nut and Filbert bushes are often used to form boundaries as separating screens in different parts of the garden. In summer their leaves are so ample that they are well adapted for this purpose. They may be used to screen buildings, or to blind anything of an unsightly nature. When allowed a little more freedom of growth than the Kentish growers permit, there is a good deal of shelter in a screen of Nut bushes, and if planted on the windward side of the garden the shelter will be beneficial to many things.

SOIL AND SITUATION.—The Nut succeeds so well under very different conditions and circumstances that one might say that, except in wet, cold clays, it will succeed everywhere; and it is difficult to understand why the best class of Nuts, such as the Cobs and Filberts, are not more grown. The failures of the Nut crop are much less frequent than are experienced among other fruits, though from the early period of their blossoming they run more than the average amount of risk. In a regular plantation the bushes may be 10 feet apart, with a Gooseberry or Red Currant bush alternating. Afterwards, when the Nuts require all the space, the Gooseberries can be removed. In all cases the ground should be well prepared by trenching, etc., before planting, as Nuts are long-lived.

PROPAGATION.—The usual methods are by layers, suckers, and seeds. The former is the best way of increasing established kinds, and is best performed in November, though the layering can be

done any time before the buds swell in spring. The branches to be operated on are brought down to the ground, and they may be of two or more years' growth. A notch should be cut about the centre of the part buried in the soil, or the stem may be split with a sharp knife at that point. A slight hole is excavated, the branch pegged down, and then covered with sandy loam formed into a basin over the part cut, which must be kept moist in dry weather. At the end of twelve months, roots will, in the majority of cases, have formed in sufficient quantity for the layers to be separated from their parents and planted in a nursery bed for a couple of years to get strong, being in the meantime pruned into shape by having the centre opened and all side branches removed from the stem, the latter to be from 18 inches to 2 feet high. Suckers are often used for propagating, but, although they involve less trouble, they are longer in coming into bearing, and do not make such fertile plants. Seeds are also often employed, and should be sown in autumn, the seed beds to be covered with slates to prevent the mice finding them and carrying them off, which they quickly do if unprotected. The slates also tend to keep the soil in an even state of moisture, and hasten germination. When the seedlings are strong enough—which will be by the end of the second year—they should be transplanted into the nursery bed and be placed in training. Grafting is sometimes resorted to for the purpose of converting the seedlings quickly into bearing plants. The same principles as are successful in other kinds of grafting will be necessary in the case of the Nut, *i.e.* the scions must be taken off and laid in moist earth in a cool place before the buds begin to move on the trees from which they are taken; and when the sap begins to move, in March, the young seedlings may be headed down, and the grafts placed on by any understood method, splice or whip-grafting being as good as any, binding the parts together firmly and covering the union with grafting clay or wax to exclude the air. All the Nuts produce the male and female blossom on different parts of the tree, the organs not being situated in the same flower, as is common with the Apple, Pear, and many other fruits. The long brown catkins, which appear first in winter, are the male blossoms, and about the time when these have reached their proper state of development—usually about February—the female blossoms burst out at the extremities of the plump little buds which appear so numerous at the ends of the feathery spray on fertile bushes. The female flower is a bright crimson tuft springing directly out of the bud, and is fertilised by the dust which falls in clouds when agitated by the March winds. Sometimes, when there is a scarcity of male

flowers, it is a good plan to cut branches from the common Nut, which are furnished with male blossoms, and suspend them on the Filbert bushes to ensure fertilisation, and so obtain a crop.

VARIETIES.—Red and white Filberts, Frizzled Filbert, Kentish Cob Nut. The late Mr. Webb, of Calcot, raised several kinds of Cob Nuts, which I have heard highly spoken of.

The Mulberry.—The black-fruited species (*Morus nigra*) is the only one commonly grown in this country. It will thrive in any good garden soil, and though, as a rule, hardy enough, yet it suffers a good deal from frost in those extreme winters which visit us occasionally. I never knew a Mulberry tree to be killed outright, but the young wood on which the fruit is borne suffers when exposed to a very low temperature, so that after a severe winter the Mulberry crop is a light one. The tree lives to a very old age, and so long as it possesses vigour enough to make and ripen an annual growth it will bear good fruit; but it does not bear much early in life. It is not often that a Mulberry bears much till after it has passed its twentieth year, unless some dwarfing system of culture be adopted.

PROPAGATION.—Cuttings and layers form the readiest and chief means of increase, and of these two methods the former is the best. The cuttings should be taken from the upper fertile part of the trees. They may be of any age, from the one-year-old shoots, with a heel of two-year-old wood attached, to branches of considerable size, sawn off any part of the tree from which a large branch can be spared. To obtain fruiting trees early, have the cuttings as large as possible, and plant their lower ends firmly in a shady border, mulching the soil around them with manure, and keeping it always moist. If cuttings 3 or 4 feet long, and of eight or ten years' growth, can be procured, fruiting trees may be obtained in a comparatively short period. Where large cuttings cannot be had, we must fall back on the young wood, with a heel of that which is older attached. These should be cut about 8 inches long, and be planted firmly in rows 10 inches apart, and 3 inches apart in the rows, burying all except the two uppermost eyes, mulching between the rows with old leaf-mould, or something of a non-conducting nature, for their shelter, and to retain the moisture around them in dry weather. The autumn is the best time to make and plant the cuttings; but if they cannot be planted so early, they must at least be cut off, trimmed, and laid in the soil as soon as the leaves fall; the work of healing and callusing the wound preparatory to the formation of roots will then begin. The second year the young plants may be transplanted to the nursery rows, and encouraged to grow into handsome,

round-headed plants, by trimming all side branches from the main stems.

PRUNING.—After the foundation of the tree has been laid, and it has started on its course with a straight main stem, the only pruning necessary will be to remove a badly-placed branch when required, and keep the growth evenly balanced ; and, in fact, this is all the pruning required throughout its career. As the fruit is borne on the young wood, it is necessary to keep this fact steadily in view ; and in any pruning that may be required always take care that plenty of young wood is left on.

WHERE TO PLANT MULBERRY TREES.—Select some cosy sheltered nook on the lawn, and either plant in groups of three or four, or a single specimen if no more are needed. A tree so distinct in character and appearance deserves more attention than it receives, and its fruit in summer is very refreshing. The Mulberry should always be planted on turf, as the fruit, when ripe, will drop. If it falls on the bare earth it becomes soiled and useless ; and usually it is the finest fruit which drops first. On the soft clean grass no harm will happen to the fruit if it does fall. The Mulberry never really wears out in the ordinary sense of the word. Old trees bear the finest fruit, and I have never known or heard of a Mulberry tree dying from old age. I know of several of very great age, which are held together by bands and tires of iron, and still bearing good crops of fine fruit.

The Barberry.—The red-fruited stoneless Barberry is frequently grown for its fruit, which makes an excellent preserve ; but the habit of bearing stoneless fruit does not appear to be always a fixed principle, for occasionally the plants raised from the stoneless variety produce fruit with stones, especially when they are young. When steadied by age the fruit generally is stoneless. It is easily propagated from suckers or offsets, which should be planted in the nursery for two or three years to get strong. These Barberries are very ornamental when planted in groups on gently-rising knolls, within view of walk or drive. The birds are fond of their fruit, so that all who wish to encourage young birds in their grounds should plant Barberries. A little thinning and shortening back is occasionally necessary in order to keep up a good supply of young wood, which bears the finest fruit. The pruning should not be done in a formal manner, but be limited to the cutting out of a branch here and there, with the view of encouraging a young shoot to spring from its base and keep up a constant renewal. The Barberry may also be increased by layers in autumn. For certain positions plants trained as standards are very ornamental, and this can easily be accomplished

by limiting the plants to one stem, and permitting no other growth to break but what starts away from the head.

The Quince.—Not only is the fruit valuable for flavouring, but the tree is well worth planting for its ornamental appearance, and a specimen or two will tend to give character and variety to the lawn or ornamental shrubbery. Standards, with straight stout stems, 6 feet high, should be selected. Propagation is by cuttings or layers. The former should be taken in autumn, 6 or 8 inches long, and be planted in a shady border. Bury all the wood, except the topmost eye, and press the soil firmly about them. Mulch with old leaf-mould, or Cocoa-fibre, between the rows, which should be about 1 foot apart, and water in dry weather. Under such treatment most of the cuttings will grow. Layers will root in about a year, and may then be detached from the parent plant. Both the layers and cuttings will require a course of culture and training in the nursery to prepare them for final removal to their permanent situation.

PRUNING.—The branches must be kept thin and regular, and to this extent pruning is necessary; but, otherwise, not much knife work is required. A very small amount of annual attention will suffice; and even if nothing has to be cut out, this annual overlooking when the leaves fall should be given, as a stitch in time saves nine. There are several varieties, but the best for culinary use is the Portugal Quince.

The Medlar.—These are not much grown; but as they do not grow to a large size, and will not, therefore, occupy much space, a tree or two should be planted where variety has any value. There are several varieties, but the Dutch Medlar produces the largest fruit. Standard trees only should be planted, and as they are not unornamental they may occupy a position in the shrubbery, ornamental plantation, or on the lawn. The fruit is not usable until decay sets in, and should be allowed to hang on the trees till late in autumn, and then stored for a short time. Medlars are raised from seed, and the particular varieties are grafted on the seedlings.

CHAPTER XI

The Gooseberry is one of the most valuable hardy fruits in every sense of the word. In a green state its excellent culinary qualities are well known, both as jam and as used freshly gathered from the bush. When quite ripe the Gooseberry is one of the few fruits which everybody likes. The climate of these islands is especially

suited for Gooseberry culture. In hot countries the berries lack both size and flavour, and though occasionally spring frost may thin our crops, yet a total failure seldom happens. As much as £100 per acre has been made off Gooseberries. It is a crop deserving of all the attention that can be given to it; but in point of fact the culture of the Gooseberry is a very simple matter, and need not occupy much time in narration.

PROPAGATION.—This is done by means of cuttings, which should be selected when the leaves fall in autumn. The longest, straightest, stoutest shoots only should be chosen, to give the necessary length of leg, and keep the fruit from being splashed with dirt during heavy showers. The cuttings should not be less than a foot long. The bottom end should be cut straight across just below the joint, and all the buds or eyes, except the three upper ones, should be cut out. The cuttings should be made before Christmas, even if they cannot be planted then, and when made they must be laid in the soil beneath a north wall. The planting should take place any time before the end of March, and I prefer the north border to any other place. They will strike root out in the open, but if the next summer turns out hot and dry the cool border is the best place for them. If they are planted in an open situation, mulch with short litter to keep the moisture about them and afford shelter. Plant in rows 1 foot apart, and 6 inches apart in the rows, burying about 3 inches of the bottom in the ground, and treading the soil firmly around them.

PRUNING AND TRAINING.—A well-formed gooseberry bush, when fully grown, should be from 5 to 6 feet in diameter and about 4 feet high, speaking roughly. The shape should be that of a basin, *i.e.* with an open centre, from which all crossing branches are removed by pruning. In training a young bush always cut to an eye pointing in the direction which we wish the future branch to take, and there will be no difficulty in making the bush assume any shape we like. There are two systems of training Gooseberries common in gardens. One may be called the formal type, in contradistinction to the more natural plan of keeping the bushes well-thinned out, but nothing more. In the formal system the tree has a more or less formally-arranged skeleton of main branches, from which spring the young shoots which are annually spurred in, the crop being chiefly borne on these spurs. According to the other plan, there is but little attempt at training, and but little shortening of the wood; the tree is encouraged to renew itself, and as much young wood is left in as there is room for. Though it is never allowed to get into a densely-crowded

condition, it is advantageous to permit as much growth as there is room for, for the sake of the shelter afforded in cold springs, and such bushes seldom fail to bear immense crops. By the regulation of the young wood the cultivator can ensure pretty well what crop he likes. In pruning one of these naturally-grown bushes the first thing is to cast the eye over the bush and note its symmetry, for it is just as easy to have handsome shapely bushes as uneven sprawling ones. Any branches that are getting near the ground should be cut back. The weight of the crop has a tendency to drag the branches downwards, and a little annual trimming will be required to keep them off the ground. Next open out the centre of the bush, removing all branches showing a tendency to cross over. Afterwards the remainder of the bush is thinned regularly, cutting out an old branch where crowded and leaving a young one to take its place. It is the constant renewal, by a gradual removal of the old and a substitution of the young, which makes this system answer so well, especially in bad seasons. The bushes may not look so regular in shape as when trained more exactly, but they are longer lived and more profitable, and when full of foliage and heavily laden they have not an ungraceful appearance. In beginning with a plantation of young bushes it is necessary to have some definite object in view, and prune accordingly; but it is next to impossible to obtain heavy crops of berries without leaving in plenty of young wood, and all those who are dissatisfied with the crop they obtain may increase it next year by altering the system of pruning.

PYRAMIDAL GOOSEBERRIES.—Though the bush form is the natural one for the Gooseberry, yet it will easily assume any other, if the necessary supports are available and time is given to the training. By starting with a young bush before it has been much pruned, placing a 6-foot stake to it, selecting the strongest shoot for the leader, and tying it to the stake, allowing the other branches to grow out in tiers, a graceful pyramid will be formed in a few years, which, if not pruned too closely, will bear very heavy crops. It must not be permitted to grow too fast, or the bottom will become naked, and then the intended object will be defeated. Some kinds of Gooseberries are erect in their habit of growth, and others have a drooping tendency. These peculiarities must be noted and corrected either by pruning or, in the case of the drooping kinds, such as the Red Warrington, giving timely assistance when young.

PLANTING AND MANURING.—After the cuttings are well rooted the young trees should be planted in nursery rows 18 inches apart and 1 foot from each other in the rows. This will give space to get them into shape, and fit them for removal to the quarter where

they are to fruit. Sometimes Gooseberries are planted round the margins of the vegetable quarters, and in such a position they should not be less than 8 feet apart, in order to give room to move freely among them. A good plan is to gather the Gooseberries and other bush fruits into beds or quarters by themselves; but the exigencies of the cultivator's situation will guide him as to what to do in this respect. In whatever situation the Gooseberry is placed the results will be in proportion to the treatment given, and manure, both solid and liquid, will be well bestowed. Mulching, too, is a beneficial process in dry seasons. Heavy crops must be well nourished, or the fruit will be inferior.

TIME TO PRUNE.—Some people leave the pruning till spring, in places where the birds, such as bullfinches and sparrows, are numerous; but if the birds cannot be kept down they can easily be circumvented. Black cotton, passed and repassed over the surface of the bushes, generally scares them. If this fails, or in association with it, to make sure, syringe the bushes with a thin mixture of soot and lime, in which a little soft soap has been added. This will stick to the bushes a long time, and when the birds find anything distasteful they seldom go near them again. Therefore, having the means of keeping off the birds, I always prune in autumn, and this gives an opportunity to get the borders and quarters manured and dressed by forking over early in the winter. When grown side by side in rows, in beds or quarters, plant 6 feet apart each way—less space will not permit of justice being done them.

SUMMER PRUNING.—This is not much attended to as a rule, but if time permits its tendency is beneficial. Simply thinning out the young wood, where too thick, is all that is needed in a general way in average culture. Where a few large berries are required for exhibition, more thinning should be done.

GOOSEBERRIES ON WALLS.—Walls or fences which are too low or not required for other kinds of fruit may be profitably used for bush fruit, Gooseberries or Currants. The Palmette is the best way to train them. When the young bushes are planted they should be headed back to get breaks from the bottom, which should be led out at right angles, one on each side. From these horizontal branches others should be taken vertically, training them about 6 inches apart. If planted about 4 or 5 feet apart the wall will soon be covered. The Gooseberry succeeds well as an espalier trained against a wire fence 4 or 5 feet high; it makes a nice verge or margin to the vegetable quarters. By planting the Red Warrington against a north wall, or the north side of a fence, Gooseberries may be had late in the season.

VARIETIES FOR EXHIBITION.—The following list of kinds have obtained prizes for the heaviest berries at the Northern shows, and are reckoned as being the best of their class :—

Red.—Lord Derby, Bobby, Blucher, London, Dan's Mistake, Maccaroni, Beauty, and Ploughboy.

Yellow.—Ringer, Leveller, Mount Pleasant, Lady Houghton, Thatcher, High Sheriff, Hit or Miss, and Pretender.

Green.—Surprise, Stockwell, Diadem, Plunder, British Tar, Shiner, Telegraph, and Green London.

White.—Transparent, Antagonist, Fascination, Careless, Marchioness, Hero of the Nile, Postman, and Princess-Royal.

To produce the heaviest weights superior cultivation must be given. The wood must be kept thin, all weak sprays being cut out in summer, leaving only the strong young shoots which will be required to bear the crop next year, and ample space must be given to let in the air and the sunshine. The bushes should be mulched beneath the branches, and in dry weather the mulch should be kept moist, as this gives off a constant vapour, which increases the size of the berries. Those who strive for the mastery in Gooseberry culture cannot afford to throw a chance away, for the competition is keen. If the bush carries more than a very limited number of berries in proportion to its size, some must be taken off, as, to the Gooseberry fancier, winning a prize is of far greater importance than having a heavy crop of Gooseberries.

VARIETIES FOR DESSERT—*Red.*—Warrington, Champagne, Wilmot's Early, Keen's Seedling, Ironmonger, Early Red Hairy.

White.—Lady Leicester, Snowball, Whitesmith, Bright Venus, Crystal.

Green.—Early Green Hairy, Pitmaston Greengage, Green Walnut, Yellow Champagne, Yellow Smith, Yellow Sulphur, Broom Girl.

In the above list are also found the best preserving kinds, such as Champagne and Warrington. To obtain first-class dessert-fruits the bushes should not be overloaded, because so many are used in a green state that it is an easy matter to thin them without incurring any waste. There is no doubt, I think, that it is more profitable in a commercial sense to gather the fruit green than permit the berries to ripen. Ripe Gooseberries are a perishable commodity, not suitable to send to a distant market ; but the fruit when green will travel any distance, and keep any reasonable length of time. When the bushes are relieved of their load early they have plenty of time to rest and fill up the buds for the next season.

DISEASES AND INSECTS.—The Gooseberry is a native fruit, improved and brought by cultivation to its present condition, and will grow anywhere in these islands. If well cared for, though often oppressed by insects, such as the aphis, which curls up the leaves, and the caterpillar, which consumes in a comparatively short time every particle of green, the Gooseberry has no special disease which the cultivator need fear. The worst things are the caterpillars, for, if neglected, they become a real trouble. In their worst form they are the larvæ of a saw-fly, which lays its eggs on the under side of the leaf about the end of May. There is a Gooseberry moth, but its progeny is not so destructive as that of the saw-fly. Perhaps the best way of getting rid of them is to look for the eggs, pick off the leaves on which they are laid, and destroy them. They will be found, about the end of May, packed in lines on each side of the mid rib of the leaf on the under side. Another and a very old plan is to scatter quicklime under the bushes and shake the caterpillars into it, by giving the stem of the bush a sudden tap with the handle of a spade. They are easily dislodged if taken unawares, but cling tightly at the least disturbance, and there is no chance of dropping them unless it be done suddenly. The insects in the chrysalis state remain buried all the winter in the ground beneath the bushes on which they have been reared. This is a good time to attack them. Sometimes a removal of the top soil 3 inches deep to another place, bringing back fresh soil, will get rid of a good number. Another remedy which I have seen recommended, but have not tried, as I have had no caterpillars of late years, is to sprinkle gas-tar beneath the bushes in the winter and stir the soil afterwards with hoe or rake. A brush made of a handful of straw drawn out straight will do for its distribution—though I have not tried this plan myself I have great faith in its efficacy—and at the same time it will be harmless to vegetation. The aphis may often be cleared off by cutting away the infested shoots, if taken in time. If the ripe fruits are required to hang any time they should be protected with nets, especially such kinds as the Warrington.

The Black Currant.—Plant in a moist situation, where the soil is rich and deep—partial shade not objected to, especially such shade as is afforded by a wall or fence; and the Black Currant succeeds better under the shade of trees than any other fruit, but the darkness must not be too dense. When the Black Currant stands long in one place it generally becomes a wide-spreading bush, with more than one stem. I have generally found the plant standing on single legs or stems bear the finest fruit, but the stool-like bushes are the longest lived and bear the heaviest load.

PROPAGATION.—Like all the *Ribes* family, this strikes freely from cuttings in any situation when planted firmly in the ground in autumn. If the bushes are to have only one stem, all the eyes must be cut from the bottom ; but if the many-stemmed bush is preferred no eyes need be taken out. One has only to take off cuttings or slips of the last year's wood and plant firmly. The cuttings should be planted in rows 1 foot apart, and 6 inches in the rows. In two years transplant to an open situation, 2 feet between the rows and 1 foot from plant to plant. In this position they may remain till planted finally. In their fruiting quarters Black Currants make wide-spreading bushes when allowed to throw up numerous stems. If confined to one stem they will not need so much space. In the former case 7 or even 8 feet will not be too much on deep, rich, moist land ; but 5 or 6 feet will be sufficient space for the smaller plants trained to one stem. As regards the Black Currant, I am decidedly in favour of the many-stemmed bush, whilst Gooseberries and Red and White Currants I would rigorously confine to one stem.

PRUNING.—The Black Currant bears on the young wood, therefore it is absolutely necessary that growth should be encouraged, and also that plenty should be left on the bush. When I say "plenty," I do not mean that all the young wood should be left, as that would ruin not only our present but our future prospects. In the case of the Black Currant, pruning is a very important operation, nearly everything depending upon its being rightly carried out, and to this end it should be rightly understood. Enough young wood should be left to bear a full crop, and at the same time space must be left for the admission of air and sunshine, and for the new shoots, which the system of shortening back old wood will develop. This should be done annually to keep the bushes in a constant state of renewal. Scarcely any shortening of the young wood will be required, and no formally-shaped bush is wanted. An open-headed regularly-shaped bush, well furnished with young wood, will bear plenty of fruit. No attempt need be made to keep the centre open. Usually when the fruit gets large the branches hang down, so that virtually the centre does open up, though this need not be provided for in any way. What we want to arrive at is a bush 6 or 7 feet high, so managed as to be furnished with young fruit-bearing wood all over it ; this will chiefly depend upon the pruner, and is done by cutting out some of the old wood annually to make room for the new. The renovation of old bushes is easily accomplished by cutting back into the old wood, and thinning the young shoots, which break away. Very fertile bushes have been created out of old hide-bound scrubby things in

one season, which, before being headed down, only looked fit for the rubbish heap.

MULCHING AND WATERING.—To do the former would be within the means of all, as short Grass is better than nothing, though manure will add size to the fruit and strength to the bushes. Where the sewage of the homestead flows into a tank near the garden in dry seasons, the Black Currant crop will pay for a soaking as well as most things.

GATHERING THE FRUIT.—It is essential that the bushes should not be too thick on the ground, or the fruit will not ripen well together. Black Currants must be gathered as soon as ripe, or they will fall and be lost.

VARIETIES.—Lee's Prolific and the Black Naples are the best, and no one need plant more.

Red and White Currants —For all practical purposes these may be classed as one, though, at the same time, it is better in planting to keep them separate, or rather not mix them indiscriminately, as the White Currant is dwarfer and less spreading in habit, and will not require so much space as the red variety. All the Ribes family are great bearers, seldom failing, and consequently ought to be well fed. Before planting, the ground should be well manured and deeply cultivated; trenched up 2 feet at least, burying some of the manure a foot deep. The surface can be kept in condition by rich top-dressing. In the ordinary course Currant bushes will last a dozen years at least; and land that is to carry one crop for so long a period should be thoroughly done before planting.

PROPAGATION.—All the bush fruits are so easily raised from cuttings that it is scarcely necessary to refer to any other method, and all that need be said about it is, Have the cuttings as long and strong as possible. Cut out all the eyes except the three uppermost, plant firmly in rows 1 foot apart, and 6 inches in the row, and transplant at the end of the second year. Currants are easily raised from seeds, and of course all new varieties have been obtained in that way; but in order to obtain any result worth noting the seed should be saved from the finest fruit of the best variety.

TRAINING AND PRUNING.—Standard trees are interesting, though perhaps of but little real utility. Occasionally they are obtained by grafting on some of the strong-growing American species, such as *Ribes sanguinea*, *R. aurea*, etc.; and this is the best and speediest way of obtaining them, though they may be trained up from cuttings by removing all side shoots. When the necessary height has been gained, the Red and White Currants bear so well on spurs that, beyond allowing for a certain natural

increase in size, there is no occasion to leave on a great amount of young wood. This should not prevent a young shoot being left wherever there is space to fill, but it is very important that the centre of the bush be kept open. A good deal of the pruning, as regards the Red and White Currants, should be done in the summer, about the third or fourth week in June. The leading shoots should be left unpruned, but all others should be shortened back to three buds. This will let in the air and sunshine, and its influence will be beneficial not only to the present crop, but also in the future. The most natural shape for dwarf Red and White Currant bushes is the open-centred cylinder. This is obtained by cutting out all branches in the centre when the bush is young, cutting always to a bud pointing outwards.

CURRANTS ON WALLS.—All bare places on walls or fences may be filled with Currants. Aspect is a matter of no consequence, but they are specially useful when grown on a north wall. In such positions, if protected from birds and wasps with hexagon netting, the fruit will hang till winter if required. The space allowed on walls should be about 6 feet for each bush; in fact, under all circumstances and conditions, this is about the amount of space which a Currant bush can profitably fill. In dry soils it will be a great help in hot weather if the ground can be mulched. The increase in the bulk and weight of the crop will pay for labour incurred.

INSECTS.—About June the green-fly appears on the young shoots, fixing themselves on the under side of the leaves, which soon assume a bronze tint and curl up. The best remedy is to cut off the affected shoots and burn them; at the same time to give the trees a good washing with soft soap and water. Soap suds from the laundry will do. A caterpillar—a near relative of the Gooseberry caterpillar—eats the leaves in summer, usually making its appearance about June, and, if not picked off or destroyed in some other way, quickly destroys all the leaves. Hand-picking is the best plan, and the next best course is to wash the trees with something that the insects do not like; soap suds, and even clean water, have a deterrent effect, and many are dislodged by it. Perhaps the worst enemy to contend with—or at least if it was common it would be the most difficult to destroy—is the larva of a moth (*Sesia tipuliformis*) which lives in the interior of the young branches, where it eats out the centre, and the young wood dies, the tree ultimately sharing the same fate. When it gets into a garden, the best course is to destroy all the Currant bushes, stamp it out at once, and obtain young trees from a new source. This may seem an unnecessary measure to take, but there is no other so

certain, and it will be the cheapest in the end. To afford protection from birds nets must be used. For preserving late fruit it is a good plan to fence a piece of land in with a framework strong enough to support a net, which is drawn over when the fruit begins to ripen. I know a garden where the Strawberries and bush fruits are worked on this principle. One set of nets does for both, as the early Strawberries are generally cleared off by the time the Gooseberry and Currant quarter is ready for covering. Single bushes may be covered with mats or hexagon netting, and this protects them from wasps.

VARIETIES—*Reds*: The Red Dutch, Warner's Grape, The Cherry (very large), Raby Castle (very late). *Whites*: White Dutch, Transparent White.

CHAPTER XII

The Strawberry in the Open Air.—The preparation of the ground for this crop is a very important matter. It should be deeply worked, and in fair condition as regards manure, though it is not a good plan to dig in long stable manure just previous to planting, for this prevents the land from consolidating sufficiently for the roots to obtain that grasp of it which is essential for the proper development of broad short-stalked foliage and plump mature buds or crowns. It is a good plan to trench up a piece of land in winter of sufficient extent for the new Strawberry bed, manuring it according to its condition. In February plant it with early Potatoes, and when the Potatoes are lifted in July have the Strawberry plants ready in small pots for turning out. This system makes the most of the land. The Strawberries which have been forced in pots for early fruit will do admirably, as they invariably bear heavy crops the first year after planting. Before planting, the ground may have, if necessary, a dressing of soot or some artificial manure. I am assuming that the dressing of yard manure which was given in winter will still, to a great extent, remain in the land, and just be in fit condition for the roots of the Strawberry plants to utilise. In the preparation of the land for Strawberries its general character must be kept in view. If very light a dressing of clay or heavy loam will be of great benefit. It should be placed on the surface, and lightly forked. The land for Strawberries should be in firm compact condition; the solid firmness of unmoved or unworked land will not do. If the Strawberries, as I have suggested, follow immediately in the wake of the early Potatoes, the surface-soil will be in a nice friable

well-pulverised condition. It is best to plant when the land is dry on the surface, as then the soil can be pressed firmly round the roots of the plants without making it hard or pasty.

OBTAINING THE PLANTS.—I have already referred to the good work which plants that have been forced are capable of doing when planted out in July. In the majority of instances, under good management, such plants are not much exhausted by forcing, and when allowed plenty of space (not less than 2 feet apart) will yield heavy crops. But good crops of Strawberries may be obtained the first year from young plants, if pains are taken with them. They should be layered into small pots as early as the runners can be obtained; in fact, treat them in the same way as we do the plants raised for forcing, and which generally gives such excellent results. It is only a question of obtaining the plants early and planting early. Neither is it necessary always to lay them in pots. I have raised good plants by laying down little mounds of rich soil, and pegging the runners on the heaps. By the latter plan the plants, when sufficiently rooted, are taken straight to the bed and planted, pressing the soil about them firmly, and giving a good watering, which, if the weather is dry, must be repeated till the plants are established. The best time to plant is in July; and the earlier good plants can be obtained and set out the better, if we want to gather a good crop for the following year. In late districts, where the July planting cannot be carried out, the plants should be laid in, 6 inches apart in a nursery bed till spring—say as early in March as the season will permit the land to be got into condition. The plants may then be lifted with balls from the nursery bed, and planted in rows $2\frac{1}{2}$ feet apart, and 1 foot from plant to plant in the rows. Every alternate plant in the rows will be cut up after the first crop has been gathered. In the meantime, the first year—as soon as the Strawberries are disposed in their places—two rows of Onions should be sown between each two rows of Strawberries. The Onions will do no harm to the Strawberries, as they do not shade injuriously; and the second year the Strawberries will require all the land. The Onions are a catch crop, to pay for labour and rent, till the Strawberries come into bearing. To prevent propagation from any but fertile plants, all those which are unfruitful should be pulled up as soon as their character is noticed, and an eye should be kept upon the bed for the purpose of detecting barren plants, as the unwary may—in fact do—propagate from inferior ones, being tempted by the deceptive strength of the runners which spring therefrom. By a judicious choice of kinds, aided by a careful selection of aspects suitable for different varieties, the Strawberry season may be much prolonged, and by

planting such kinds as Garibaldi and Vicomtesse de Thury from the forcing pit a good crop in autumn may be gathered. Such early kinds as Black Prince and Vicomtesse (above named) should be planted on a warm south border to come in early, and the Elton Pine should be planted in a partially-shaded border under a west wall or fence for the late crop, and then the Alpines will carry on the season till October.

DURATION OF THE BEDS.—This is mainly a question of local necessity and circumstance. So long as Strawberries will go on bearing well, except it may be for the purpose of rotation, there is but little inducement to remove them. At the same time it must be admitted that, even in those favourable situations where the Strawberry is a long time in wearing out, young strong plants generally bear the finest fruit; and on all soils there is a limit to profitable duration. Then, again, some kinds will continue profitable without change longer than others; but as soon as any plantation shows signs of wearing out, *i.e.* when the crowns grow weakly and the fruit small, the sooner they are destroyed the better. On really good Strawberry land (a deep rich adhesive loam), if the plants are allowed plenty of space, say a square yard for each plant, I have known Strawberries go on bearing heavy crops for seven years, but usually from three to four is as long as they should remain on the same land. I have known instances where annual planting seemed to be the perfection of culture. In this latter case the Strawberries were worked in connection with the early Potatoes, and were followed immediately by late Broccoli, the latter crop being planted without digging. As a rule light land, unless it can be improved by a dressing of clay, will not carry Strawberries more than three years. It is more profitable to plant them in lines or rows $2\frac{1}{2}$ or 3 feet apart than to plant in beds. If the necessary attention be given to the young plants thick planting will be found a mistake. Some people plant thickly at first, because the plants are weakly; but it is better to take more pains with them, and trust to half the number.

REMOVAL OF THE RUNNERS.—As soon as the required number of plants are secured all runners should be cut off, as they tend to exhaust the crowns. If young plants are not required the runners should be cut off before they attach themselves to the ground. Some cultivators plant a bed specially for their production, removing the trusses of flowers, and where this can be done all the runners should be removed from the beds in bearing. Though it is not much practised, propagation may be carried on by division of the crown of the plants, planting only the strongest of them. In this case no runners are required, and they may be cut away as

they appear. When Strawberries are propagated by division, the plantation must not continue longer than three years in one place.

TOP-DRESSING AND WATERING.—Strawberries being to a large extent surface-rooting, top-dressing plays an important part in their culture, or should do. If we have a bed or quarter of exhausted Strawberries and it is not convenient to replant—or if we can make a new bed and still wish to retain the old one another year—as soon as the fruit is all gathered dress off all runners and dead leaves, place a layer of old cow dung 3 inches thick between the rows, leave it there without digging or forking, or any other effort at cultivation, and watch the result. In the spring, as soon as the blossoms appear, mulch heavily with stable litter; by the time the fruits are ripe the rains will have washed the litter clean, and the Strawberries may rest upon it without sustaining any damage. Sometimes supports are used to prop up the fruit and lift them into the sunshine. It is an advantage where it can be done. The largest clusters may be supported by short forked Hazel pegs, in default of anything better. As regards watering in a dry time this adds immensely to the weight and value of the crop. I was in a garden a short time ago where the Strawberries were all withering for want of water, and the fruit did not attain half its usual size because of the drought. Liquid manure in any shape has great value. Where slugs and snails are troublesome a good watering of limewater in April will do much to eradicate these troublesome pests. If the weather is showery at that season the lime will be as effective if dusted between the rows and around the plants, and left for the rains to wash in; soot is also valuable. To sum up the principles of Strawberry culture, I should define them briefly thus: Work the land deeply, but allow it time to settle and consolidate. Manure liberally, but do not let the roots come in contact with fresh rank manure—let it be mellow. Select the plants with care from known fertile plants only, and as some old favourite kinds occasionally show signs of wearing out, obtain fresh stock from a good source sometimes. Give each plant as much space as it can profitably occupy, according to its kind,—this may vary from a square yard to less than half,—and allow it to occupy that position just as long as it is profitable, but no longer.

INSECTS, DISEASES, ETC.—If well cared for insects are not troublesome to the Strawberry. The greatest pests on some soils are the slugs and snails, which should be met and destroyed early in spring by dressings of soot and lime. Rats, mice, and birds, especially blackbirds, are very destructive to the ripe fruit. Of all these troubles I dislike the mouse worst, because he does

not eat what he gathers, as he is only seeking for the seeds which grow on the outside of the berries. Rats and mice may be trapped and poisoned, but a few good cats in the garden are most useful; and where they have plenty of space to run about at will, they do not scratch up the plants as they do in small town gardens. I have several cats, and they have free access to every building and every part of the gardens. To keep off birds, nets should be used, and the blackbird dislikes the gun if it be in the hands of a good shot. I have always found that shooting a few at the beginning of the fruit season makes the others very shy for the remainder of it.

RAISING SEEDLINGS.—The plants should be grown in pots in the frame or the greenhouse, and the crossing effected by using the camel-hair pencil. Only the best kinds should be grown, and as soon as the selected fruits are thoroughly ripe gather them and peel off the outside, which contains the seeds, cutting only a thin slice, and lay the slices on a sheet of paper in the sunshine. The pulp will soon dry up, and then the seeds may be rubbed out and sown in pans in a warm frame. The seeds will soon germinate, when the plants should be pricked off, and planted out when hardened. They will fruit the following year if justice is done them, when the best can be selected for further trial, and the others destroyed.

VARIETIES.—Sir J. Paxton, Sir Charles Napier, Marguerite, James Veitch. The above are large-fruited kinds, and heavy croppers on good land. Vicomtesse Hericart de Thury—Well adapted for planting in unfavourable situations, such as light porous soils. British Queen—An excellent old variety. When well done the flavour cannot well be eclipsed, but the plant is somewhat tender. Keen's Seedling—Another excellent old sort, for main crop or forcing. President—An excellent mid-season kind, and forces well. Loxford Hall—Should be grown where Strawberries have to be sent long distances, because of its firmness as well as its other good qualities. Elton Pine is valuable for its colour and its lateness. The Alpine Strawberry—We find this very useful, and under good culture it bears long and heavily. To bring out its full capabilities requires a deep, rich, moist soil, and it should not be left too long in one place. Heavy mulching with manure between the rows will be a great help in a dry time. There are several varieties besides the red and white Alpines in cultivation now, and they will probably increase in number. Galande and Blanche de Orleans are good varieties. Hautbois (Royal)—This is a distinctly-flavoured Strawberry not much grown now, though it was once highly esteemed. It requires

a well-drained deep loam to do it well. If the soil is not deep it will be a good plan to throw it up into a ridge and plant on the ridge.

CHAPTER XIII

The Raspberry.—The Raspberry renews itself from its base annually, and, besides the shoots which spring directly from the crown, it sends forth on all sides underground stems which cast off suckers that are commonly used for increase of stock; but only enough of these suckers to meet requirements should be permitted to remain, as they have an exhausting tendency. With an established plantation the usual plan is to hoe up all suckers except those near the lines of plants, and only a limited number of these should be left. Raspberries may be raised from seeds, and it is best to sow in pans in a frame, and transplant when large enough. Few people give any attention to this matter, but it is worth some consideration, as the Raspberry, like all other fruits, is capable of improvement. To save seeds select the finest fruits, and separate the seeds from the pulp by squeezing and washing. Dry them in the air in a cool room, and place in a drawer till March, and then sow in a gentle warmth in frame. Raspberries treated in this way soon bear fruit; there is no long period of waiting to know results.

SOIL AND SITUATION.—The position of the Raspberry quarter should be cool and moist, and this being an indigenous fruit, growing wild in woodland districts, seems to suggest the inference that partial shade is desirable. But though as a matter of fact they will grow in the shade of other plants or trees, the best results are obtained where nothing overhangs, and they will not fruit freely unless they receive plenty of light and air.

NEW PLANTATIONS.—These may be made any time during autumn and winter, but the suckers or the young plants should be lifted from the old plantation and be laid in till opportunity serves to plant them, and this should not be later than the first week in March. In the meantime the ground should be well prepared by trenching, digging in plenty of manure, for Raspberries are gross feeders, and the question of manure is an important one on dry porous soils. It will be an advantage, if Raspberries must be planted in a dry porous soil, to prepare trenches or lines by digging in a larger quantity of manure along the site of the rows, adding some clay or heavy loam if it can be obtained.

TRAINING.—The best way is to plant in rows 6 feet apart, and from 1 to 2 feet apart in the rows, according to the strength of the plants. The first year the plants should be cut down to 1 foot. If the canes were strong a light crop will be obtained the first year, and a better one the second year, and the third the plantation will be at its best. They will require no training the first year, but the second a number of short stakes should be driven in 10 feet apart, and $4\frac{1}{2}$ above ground. A couple of wires should be strained from end to end of the rows, and secured by nails or small staples to each stake. The upper wire will run along the top of the stakes, and the lower one about halfway up. To these wires the canes will be tied with bits of the Golden Willow, and be shortened back within an inch or two of the top wire. There are other ways of training; but the most wasteful one, I think, is the old-fashioned plan of tying the canes in a bundle with a stake in the midst. But those who cannot obtain stakes may obtain a fair crop without any training. The field crops are mostly grown so. The rows should be planted 4 feet apart, and the canes be pruned back to 3 feet. In the course of a year or two after this system is adopted, if the young canes are well thinned out in summer, they will acquire such strength as to be virtually self-supporting. Another way is to leave the canes the full length, and form them into arches by reaching the canes from opposite stools till they meet, and are secured in the centre, forming an arch. In windy districts they are occasionally dislodged, but on the whole fair results are obtained.

TOP-DRESSING AND WATERING.—There should be no digging in the ordinary meaning of the term among Raspberries. The surface should be stirred up with a fork in March, to correct its acidity and closeness; and as soon as the dry weather sets in, early in June, top-dress with manure, and give an occasional watering to help to swell off the fruit to a good size. Watering adds size and weight to the fruit, though it does not improve the flavour of ripening fruit. Raspberries will live and bear fruit for a considerable number of years in one position, but I have never yet known an instance where it did not pay to transplant at least every ten years, and, in some instances, it has been advantageous to move at shorter intervals. When moved frequently there is no cessation of fruit bearing. It is only when they remain too long in one place that a new plantation takes several years to establish itself. In moving Raspberries at frequent intervals they are taken up and moved to the place assigned. The canes are thinned out and shortened to 2 feet, which will permit of a good crop being gathered the first year, and leave plenty of surplus strength

in the plants to grow good canes for the following year. When brought into a system of rotation the Raspberry is much more manageable than when allowed to continue for long periods on one piece of ground. It is very important that the young canes be thinned out to a reasonable number in summer. In all systems of training or management this should be done.

RASPBERRIES IN AUTUMN.—The autumn-bearing kinds should be cut down to the ground every winter, as they bear on the young wood. If the old canes are left they will probably lose their autumn-bearing character, because the crop which the old canes would bear in summer would exhaust them. The autumn-bearing Raspberries should be planted on a dry warm site, but the soil should be deep and in good condition. They may be planted in rows from 4 to 5 feet apart, and 2 feet from each other in the row. On some soils they do not need support, as the growth made is short-jointed, and strong. The best crop of autumn Raspberries I have ever seen were in Norfolk, on rather sandy soil. I have the same varieties in Hunts, but they do not reach the same excellence.

VARIETIES.—*For Summer*: Carter's Prolific, Cornwall's Victoria, Falstaff, Semper Fidelis, Red Antwerp, Yellow Antwerp. *For Autumn*: Belle de Fontenay, October Red, October Yellow.

Blackberries.—Of late years the American Blackberries have attracted some attention, and probably are destined to win more favour when better known and understood. It is true they have not up to the present time succeeded everywhere, but hitherto they have scarcely had a fair trial. To do them justice they require a considerable depth of good soil and plenty of room to ramble; they also need supports. The best way to train and manage them is to create a special site, manuring it well and digging it deeply. When the plants get strong (which will not be the first year), erect a fence to train them 8 feet or so high. A mulching of manure will be beneficial when they bear freely. Plant 2 feet apart. They are best planted in single rows in some sunny position, and may be used to form a boundary screen in a situation not too conspicuous. They are easily propagated by suckers and layers. The Lawson is the best-known variety at the present, but others will doubtless be introduced or raised. It is liable to injury from late frosts, but the same risks have to be run in the case of all hardy open-air fruits. Our own native Blackberries might be much improved by cultivation.

PART IV

FRUIT CULTURE UNDER GLASS

CHAPTER I

The Early Vinery.—For early vines a lean-to house is the best. Years ago, when heavy timbers and small squares of glass were employed in roof building, there was an advantage in having the pitch of the roof calculated to benefit by every gleam of sunshine in the short dark days. Now this is a matter of less importance, as the proportions between timber and glass are altogether altered, and a roof constructed at what carpenters call “half-pitch,” or say an angle of 45° , will suit all kinds of forcing, provided the aspect is south or south-east. Though sorely tempted, I refrain from entering into any discussion about the different systems of glazing, further than to say that whatever plan is adopted it must ensure freedom from drip, as many pounds’ worth of grapes are destroyed every year from the water leaking through the roof and dropping among the fruit inside. This may be partly due to neglect in painting, etc., but much is owing to faulty construction. Again, many people who pride themselves on keeping the outside well-painted and in a good state of repair, altogether neglect the inside work, which is of equal importance in keeping the roof dry and sound. From an artistic point of view the new system of constructing hothouses is a loss; but if, as I believe, it will lead to greater economy and efficiency, the artistic, so far as the working-houses are concerned, must give way. The arrangements for heating and ventilating should be as simple and perfect as it is possible to make them; and there is nothing gained by doing things grudgingly, though of course it is possible to buy gold too dear. In the matter of boiler and pipes it is better to have an excess of power than a deficiency. Some time ago I was con-

sulted about an unsuccessful early vinery, whose failure was entirely owing to false economy in the matter of pipes. During the forcing season the pipes had to be unduly heated to keep up the requisite temperature, and the atmosphere became so scorched and dry that it was impossible for healthy progress to be made. Much of the annoyance and loss arising from the attack of red spider may be traced to this cause. It is a "penny wise and pound foolish" system. It is always best to call in some practical man to advise as to the size of boiler and the amount of pipe that should be employed, for although there are certain general rules laid down in scientific books as to the amount of pipe required to warm any given number of cubic feet of air to any special degree of temperature, yet there are always local conditions and circumstances which should be taken into consideration in all calculations of this nature. The ventilation, or the means of changing vitiated air for fresh, should be ample, openings near the ground line being especially important; and if the stream of air from this source be brought immediately into contact with the hot pipes on its admission so much the better. The early vinery may be any size, but from 30 to 40 feet long, and from 13 to 16 feet wide, is a good useful size; height of back wall to be about 14 or 15 feet, and the front 6 feet 6 inches or 7 feet high, the upper 3 feet of the front to be glass lights made to swing on pivots with machinery. Sometimes the top ventilation is in the upper part of the back wall, but for the early house I like the ventilators to be in the roof. When the openings are to the north, cold draughts are created. As regards the ground-line ventilation referred to, this may be effected by inserting ventilating bricks in the bottom course above the ground line, the means being at hand to close them when not required. The front wall should be built on arches, or on 14-inch piers placed under each rafter, on which the wall-plates can rest.

MAKING THE BORDER.—In some situations good Grapes have been grown without any very elaborate preparation of the border. But the vine pays best with generous treatment, and in nine cases out of ten, if stunted and starved by planting in a makeshift border, the result is not satisfactory. For early work I prefer a narrower border than is commonly made, with an occasional lifting of the roots, adding at the same time fresh turfy loam. The usual guiding principle is to make the border as wide as the rafters are long, so as to allow the roots to extend as far as the branches. This principle need not always bind us hard and fast, as in cold damp situations I should prefer a narrow border, well under control, with the means of correcting the slightest tendency to disorganisation should the usual evidence appear of long-jointed wood or a

deterioration of leaf-growth. Assuming that the border when fully made was 18 feet wide, I should prefer to have 6 feet inside the house and 12 feet outside, and to make it piecemeal. The first year I would make 3 feet inside and 4 feet outside. If well supplied with water, and mulched to keep the roots near the surface, this would be sufficient for two years. At the expiration of that time I should add 3 feet more inside, and the same width outside, and make the remainder when the vines needed more food. The border must have a good dry foundation, with a proper outfall for all water. The depth of border depends upon circumstances. Where the subsoil is bad it will be better and cheaper to make it chiefly above the surface, removing as much of the bad soil from the bottom as may be necessary to let in a good foundation of concrete and a layer of drainage on the top. The concrete should be 5 inches thick, and be laid at a sufficient inclination to drain all surplus moisture to the front. When the concrete has had time to get firm, place on the top of it 9 inches of brick rubble for drainage; then place a layer of sods, and on the sods 2 feet in depth of turfy loam, such as can be obtained from the top 4 inches of any old sheep pasture, with about 1 cwt. of bones to each cartload of loam, and enough old lime or plaster to ensure porosity when the fibre shall have mouldered to decay. Besides the chemical effect the lime and the bones will have a considerable manure value. If any other manure is given, let it be placed on the surface as a top-dressing or mulching. Liquid manure will supply the needful support as required, and a concentrated manure, such as guano or any of the artificial kinds now so much used, will give increased strength and vigour without clogging up the pores of the soil. The border may be made any time except in the depth of winter. I should prefer to make it in March, and plant about May or June. If the top spit of the pasture cannot be had, then make the border of the best soil obtainable, adding the proportion of bones and old plaster, employing stimulants according to judgment, and top-dressing early in the season, to keep the roots in the upper stratum of soil.

RAISING THE PLANTS.—This is mainly a proprietor's question. If money is no object, two sets of vines may be planted, one set being strong fruiting canes, specially prepared, and for which a long price will be charged, though not extravagantly high, considering the value of the crop; and the other set to be one-year-old plants, which should be planted under the rafters, to stand as permanent vines. The strong canes should be planted under the centre of the lights, to produce an immediate crop of fruit; probably a second may be taken, and then they should be removed to make room for the permanent vines beneath the rafters. In many cases

it is expedient to raise the plants at home, though, as a rule, there are not facilities in private gardens for growing the fruiting canes so successfully as can be done by those who make a specialty of this branch of commercial gardening. Where fruiting canes are planted the border should be made in autumn, and the fruiting vines planted in January without disturbing the roots. There are several ways of raising young vines familiar to gardeners, but single eyes planted in sods of turf or in single pots is the simplest and best. The cuttings to furnish the eyes should be chosen from well-ripened wood of good substance when the vines are pruned in autumn, and be laid in moist soil, in a cold situation, till January. In cutting out the eyes, a portion of wood on each side of the eye should be left—half an inch will be sufficient. If planted in sods, the latter should be about 4 or 5 inches square. A little soil should be scooped out of the middle, the eye inserted, pressed down, and covered with light rich soil. The sods may be placed close together in a warm frame, or in a place where a night temperature of 60° can be obtained. I have succeeded with them very well on a wide board placed over the hot-water pipes in a light position. The board had an edging of lath round it. The eyes may also be planted in 48-sized pots, one eye in the centre of each pot, and be covered about half-an-inch deep with light rich soil, the pots to be plunged in a gentle bottom-heat, or they will do very well if only half plunged. It is always advisable to put in double the number of eyes we require of plants, as this gives a power of selection which it is very desirable to possess, for some of the plants are sure to be less vigorous than others. If the eyes are started in January, grown on in a temperature of 60°, and their wants carefully attended to, they may be planted in the border about the end of April or beginning of May. When first turned out, and for some time afterwards, the border should be watered with warm water round about the plants. Very good results have been obtained from young plants raised from eyes the same season, but no check must be given by planting in a cold border, or by allowing them to be pinched in small pots before planting. If young vines, grown from eyes the same season, are planted before the roots have had time to coil round the pots, the balls need not be broken up. But in planting older plants as permanent vines, the roots should be uncoiled and laid out straight, and in that case, to prevent too severe a check being given, the plants should have been brought on steadily in a low temperature, and be planted when the eyes have broken nicely; and when they are beginning to feel the action of their roots, all the buds, except three near the bottom, should be rubbed off, and from these three the best should be selected to form the main stem.

TRAINING AND PRUNING.—I am satisfied that a great many vines are trained too near the glass. No allowance, except in a few cases, has been made for the altered conditions of hothouse building and the lighter structures of the present day. When vines are trained close to the glass—the roof being composed of large squares of glass, and not much timber being used—they are exposed to extremely sudden changes of temperature; and not only is this so, but the range of temperature is much greater under a modern roof than it was under an old-fashioned one. I know a case where the vine leaves lost colour in a most unaccountable manner during a spell of hot weather; the leaves did not scorch, but assumed a brownish-yellow colour round the edges, which gradually spread to the centre. The next year the trellis was lowered to 2 feet from the glass, and the green healthy tint came back again. I think that in no case should vines be trained less than 18 inches from the glass, and where the roof was very light I should recommend 2 feet as the minimum. As regards pruning, nearly all vines are started at first on the spur system, and where the roots can be kept near the surface no other system is needed. But in the case of deep-rooting vines, the rod system has the advantage of giving the pruner a better opportunity for securing a full regular crop of bunches, of larger size than would be obtained by spur pruning. Of course I should say that when vines are so deep-rooted—so out of hand—as not to throw plenty of bunches, the roots ought to be lifted and brought back to the surface. But many people somehow seem afraid of touching the roots of their vines, though there is no plant which submits to root disturbance so well as the vine does, and, as a rule, derives so much benefit from it.

BEST KINDS TO PLANT.—The Black Hamburg is unrivalled as an early black Grape, and Foster's Seedling, though inferior to it as regards flavour, is still, on the whole, the best companion for the Hamburg when both have to be grown in the same house. Buckland Sweetwater is an excellent early white Grape, though hardly so sure and regular in its cropping as the Seedling. But when worked on the rod system, or some modification of it, the Buckland Sweetwater bears freely, the bunches and berries being of large size. If another early black Grape is required plant the Maddersfield Court Muscat. The fruit sometimes cracks when colouring begins, but the best cure, I think, is to hang a good load of fruit upon it, and leave a good covering of foliage, allowing the laterals a little more freedom than is customary till the fruit is ripe, when they may be gradually removed. This is a valuable Grape, but will not keep long.

ROUTINE WORK.—For the first year this will be directed chiefly to the encouragement of growth. Young trees require a good deal of water, both at the roots and also in the atmosphere. The young rods must be tied to the wires as they progress; when they are 5 feet long pinch out the point of the shoots to strengthen the back eyes. Another leader will start, and this should be laid in full length. The laterals should be pinched to one leaf. It is better to have moderately-sized wood, well ripened, than large canes which are immature and soft and spongy. The maturation of the wood is the most important business in fruit growing. If the bunches of Grapes are not packed away in the buds before forcing begins, no amount of forcing can produce them, and this ripening requires warmth, with a free circulation of air. As a rule, if the roots are near the surface there is not much difficulty in getting the wood well ripened in the case of forced vines. In supplying atmospheric moisture many good gardeners do not use the syringe after the buds are started and leaves have developed, trusting entirely to damping the floors and paths. This is an operation that requires judgment. On fine bright days much more moisture will be necessary than when the weather is cloudy; indeed, in dull weather the damping may be discontinued, or at least should only be lightly done. No hard or fast line should be laid down, for if, in persistently carrying out any rule, too much moisture is used, mildew may be generated; or if, on the contrary, the atmosphere becomes too dry, red spider would probably make its appearance. A healthy, buoyant, growing atmosphere is required, and to secure this the outside temperature will form a good guide. When the weather is settled and bright, the interior of the vinery should have a good damping at closing time.

Management of Fruiting Vines.—As regards the period of time which should elapse before young vines will bear a full crop, very much depends upon the treatment they have received. In a good light house, with liberal treatment—*i.e.* feeding well with liquid manure and using highly concentrated stimulants—vines struck from eyes in January will bear a good crop of fruit the next year. The young vines are led up to the top of the house, then stopped, and not allowed to proceed any farther, all laterals being pinched back to one leaf. Very substantial canes, capable of carrying from fifteen to twenty pounds of fruit, can be grown in one season if all things are well done. It is true that most people are contented to wait a longer period for a full crop the whole length of the rafter, saying—and in many instances with truth—that if you crop a young vine, or work a young horse, too soon, it must be at the expense of the future. Some are willing to dis-

count the future, and, in the case of any plant so easily and quickly raised and grown to a fruiting size as the Grape vine is, there is not much risk to run. At any rate hundreds who build vineries are anxious to have fruit from them as soon as possible. Where young fruiting canes are provided a crop may be had the same season as the house is built, if it is finished early in the year; but I have shown that a good crop may be taken the second year without incurring that expense, whilst cautious people will probably prefer to wait for a full crop till the third year, meantime taking a few bunches from the bottom the second year. An old friend, a successful Grape-grower, always allowed his young vines to grow freely the first year, then cut them back to within a foot of the bottom of the rafter, and led up a rod, which bore a heavy crop the next year, the whole length of the rafter. The old-fashioned way is to cut back to within 4 feet or so of the bottom at the end of the first year, and take three or four bunches of Grapes from the bottom eyes. A further instalment of growth is made next year, and the whole house filled up the year following. It will thus be seen that it is a cultivator's question altogether. If we like to go in for high feeding and take pains with the roots to keep touch of them—if I may so term it—it does not signify much when or how the crop is taken. If we possess the knowledge and ability to produce young canes of sufficient strength to bear a full crop, and can by maturation lay up the bunches in the eyes or buds in autumn, it is as certain as anything unaccomplished can well be, that in the spring, when the leaves unfold, these bunches will also appear, and that by judicious feeding—by, in short, giving the necessary support—the Grapes will in due time ripen.

THE EARLY FORCING OF GRAPES.—To have ripe grapes in May, forcing should begin in November. If June will be early enough, then forcing may be delayed till the beginning of the new year. For the first ten days simply shutting up the house and keeping the atmosphere moist with the syringe will be sufficient; the inside borders should be examined, and, if necessary, which it probably will be, a good soaking of tepid manure water should be given. If the vines are young, the rods should be bent back and laid along the front of the house; but as soon as the buds burst forth the rods must be tied up in their places. If they break sluggishly, take hold of the sleepy vine rod at the extreme end and twist it as one would a rope until the pressure is felt its whole length. This, in every case in which I have tried it, liberates the sap, by rendering the cells and tissues of the stem or branch more flexible. Ten days or a fortnight after the house has been closed the fire should be lighted, the night temperature at this period to be from

50° to 55°, with an advance of 10° in the daytime, from fire-heat. When the sun shines the thermometer may run up to 80°, or even higher with a moist atmosphere. Unless there are plants in the house very little ventilation will be required until the vines break; the main object should be to surround the stems and buds of the vines with a moist atmosphere at a genial growing temperature. Sometimes the stems are enclosed in Moss, which is frequently syringed, to keep the vines almost constantly moist; but though this is useful in some cases it need not be—indeed is not—generally practised. As a rule, most vines yield readily to heat and moisture when steadily continued. I have occasionally, when the buds refused to move quickly enough, increased the night temperature to 60°, or even 65°, and then dropped off again a little when the requisite impulse had been given. Once I had a lot of pot vines I wanted to get in early in a low pit, and as they did not move soon enough to my liking, I matted up the pit, and kept the interior warm and moist till the buds started, which was in a very short time, when, of course, the temperature was dropped to its proper condition. Temperature and ventilation are most important matters in Grape forcing. In all things regularity has great value. After growth fairly begins, extremes should be avoided. When the leaves are unfolding the night temperature may be kept as near 60° as circumstances will permit, and though in cold windy weather there may be a little fluctuation, there should be no difficulty in keeping it steadily at 60°, or thereabouts. When the bunches show, the temperature should be increased to 65°, which in the case of Hamburgs and Sweetwaters will be found high enough; and no harm will happen if the temperature falls to 60° in the morning, at which time the lowest point will be reached. It will not be wise to follow any particular rule in the application of moisture. Every person in charge of a vinery should think and observe closely, using his own common sense; and he will soon come to see that, if he keeps a nice, genial, growing atmosphere in the house, it matters but little when the house is damped down, or if on some days it is not damped at all. Head gardeners lay down a general rule for their young men to follow—that the houses should be damped when they are closed in the afternoon at half-past three or four o'clock; but there is, or should always be, a proviso that on dull sunless days, or if the atmosphere in the house appears pleasantly-genial on entering, there should be only a very slight sprinkle, if any.

COVERING THE BORDERS.—Where the vinery is for Grapes and nothing else, a moist genial atmosphere can easily be created by building up a bed of manure and leaves in the house on the border,

and turning it frequently. This was a very common plan in old times; but modern gardeners generally have their vineries full of plants all the winter, and cannot afford to run any risk with them, for it must be borne in mind that if the manure is not thrown together and fermented a little before it be taken into the house, the gases which are generated by fermentation will destroy vegetable life if in active growth. But in all cases, both the inside and outside borders should be mulched for the purpose of encouraging the roots to keep near the surface. And as roots cannot live and perform their work without moisture, the only chance of keeping the roots in the upper stratum of soil is to keep them mulched with short manure. But any soil, if mulched constantly, will become pasty and sour, and once a year (in the case of forced vines this should be done after the fruit is ripe) the mulch should be taken away, and the border loosened up with a fork, to let in the air to sweeten it. Before forcing begins, a light top-dressing of whatever artificial stimulant is used should be sprinkled over the borders, which should then be covered with leaves mixed with sufficient manure to hold the leaves together and prevent their blowing away. This covering should be looked upon rather as a coat to keep the warmth in the border which is already there, than to impart any warmth to it by its own fermentation. I have seen very wonderful results follow the use of fermenting materials on vine borders; but there is a danger in their use, as it is very difficult to keep the temperature regular in degree. As healthy vines will produce good Grapes without artificial heat in a well-drained border properly protected, there seems no necessity to make a hotbed on the vine border, and the idea of warming a vine border artificially with hot-water pipes never met with much favour from practical men, on account of the known dangers which attend their use.

DISBUDDING.—All healthy vigorous vines will produce more shoots than can or should be laid in, and these should be removed as soon as the shoots showing the best bunches can be distinguished. These latter should be regularly placed along the rods at intervals of not less than 12 to 16 inches. They are often left much nearer, but it is a mistake, as one handsome bunch of Grapes is of more value than two of inferior quality, and the leaves, if they are to do their work well, must have breathing room.

STOPPING AND TYING.—Many good cultivators pinch out the leading bud when the shoots have made one leaf beyond the bunch, but where there is space for their perfect development I think two are better. The stopping should take place as soon as the leaves can be seen. It is a waste of strength to leave the shoots to extend

and then cut back. In dealing with the laterals, which, in the case of young vigorous vines, will be constantly starting forth, the common practice is to leave one leaf and allow no further advance, and, as a rule, this is very sound practice. The one leaf and bud will keep the main buds from breaking, and act as a safety valve in the case of exuberant vigour. There are cases, when the root-action is sluggish, where it may be wise to depart from the rule laid down, and permit a little more lateral growth to waken up the roots and stimulate them to greater exertion. Tying down the shoots to the wires may seem to the uninitiated a very simple matter, but it requires great care and patience to get all tied down in their places without a mishap. Scarcely any of the shoots will bear to be drawn down to the wires all at once. A string of matting should be fastened loosely round the branch about the middle of its length, and drawing the shoot down carefully, as much as it will bear at the time, fasten the matting to the wire, and so on, each shoot in succession, till all are secured. In a few days the whole may be gone through again, and on this occasion perhaps they all may be drawn down to the trellis. If too much pressure is brought to bear the shoots will split off, and an unsightly blank be left; hence the necessity for doing the work tentatively.

WATERING INSIDE BORDERS.—Taking 30 inches as the average rainfall of the country, any one may, in his own mind, make a rough calculation whether Nature or himself is the most liberal paymaster. If we erect a building over a piece of land, and plant a tree or trees therein, it is incumbent on us to see that those living things we have immured have drink enough. It is true that if they are not supplied with what they require, they will help themselves from some other, perhaps unwholesome, source, which will in the course of a short time disorganise their growth. The only chance of keeping healthy roots near the surface is to keep the soil moist, not only when the vines are in active growth, but at all times. Of course less will be required in the short days than during the growing season in spring and summer. But not only will inside borders require liberal supplies of water, but the roots outside, if they are to be kept near the surface in dry hot weather, must have water. To avoid making mistakes, every person having charge of vineries should make himself acquainted with the construction and constitution of the borders. Unless we possess this knowledge it is difficult to know when and how to water. It is, of course, possible to injure the borders by over-watering—by washing the fertility out of the soil; but I imagine, so far as regards inside borders, that this is a rare case. It is necessary, in watering borders of forcing-houses, to take the chill

off the water before using it. Cold water tends to lower the temperature of protected borders, but heated water, if even only slightly used, raises the temperature of the soil. A well-drained border is not easily or often over-watered; but if too much water passes through it the character of the soil is injured. This question is closely allied to the application of stimulants in the shape of artificial manures. I think more might be done with guano, or Clay's fertiliser, or Standen's, or Amies's manures, or anything else of a like nature. I have no desire to prefer one manufacturer before another, as probably all these stimulants have good qualities, and plants like a change of diet. The proper supply of atmospheric moisture is more essential than even the watering of the border, important though that is. In the early season, before the vines break, the syringe is the implement commonly employed; but when the leaves unfold, unless we are very sure of the purity of the water, syringing should cease, and the supply of moisture be given by damping the paths, walls, borders, etc. In forcing, closing early of an afternoon on a bright day gives us an opportunity of thoroughly damping the house, and also an immense push to the young growths. Shutting up the sun's rays in the house and keeping them there as long as possible is the very essence of economical forcing, but when we close early we must create a genial atmosphere, or the house will be filled with insects. Most of the growth, or at least the elongation or lengthening out of the young wood, takes place at night, and this growth is consolidated by the sun's warmth in the daytime; and it is easy to tell the growth made during a dull damp time by the length of the joints. If red spider appears, the best way to deal with it, if taken in time, is to shut the house up early some warm afternoon, and fill the atmosphere full of moisture, and keep up a state of saturation for a couple of hours, or until the temperature falls below 70°.

NIGHT AND DAY TEMPERATURES.—It may be taken as a general rule that we shall not go far wrong if we successfully imitate natural conditions. In the open air the swelling of the buds is a gradual process, and usually the healthiest growth is made after a sharp winter, with the spring somewhat backward; but where no times of cold east wind intervenes—where, in fact, the progress is unchecked from the first opening of the buds,—starting at a night temperature of 50°, with a rise of 10° or 15° at midday, and gradually rising to 60° or 65° when the fruit is setting, is a safe steady-going course. Some rapid forcers start at once at 60°, and deluge the place with moisture, with the view of forcing growth at once. In experienced hands this is generally attended with success,

as it enables us to give a longer period of rest. It resembles allowing a person to lie in bed till the last moment, then pull him out, give him no time to rub his eyes, but push him into the battle at once. Good results are obtained in this way, and probably in the future it will be more generally adopted. It is as well to know something about the character of the vines before we decide which course to follow, as severe forcing may perhaps run weakly vines out; and some will say that it is better to get rid of them and start afresh, or otherwise lift and replant. I shall have something further to say about the renovation of old vines in a future chapter. I will only add now that vines are more manageable in this respect than any other fruit—Pines excepted; and I am not sure that I need except any, for I have seen vines pulled out with the lack of care which is generally shown towards things we intend destroying, and after they had lain upon the rubbish heap for a week a sudden whim or a change of mind caused the vines to be planted in boxes, in a low lean-to house, the boxes containing the roots being enclosed in a bed of leaves, and that same season a good crop of well-coloured Grapes was gathered in June.

THINNING GRAPES.—Early Grapes need not be thinned quite so much as late ones are. The latter are expected to hang for some time after ripening, and moisture may probably lodge among the berries if left too thick in the centre of the bunch. Thinning Grapes, like many other matters in gardening, can only be done really well by those who have had some experience of the vines in question. There is so great a difference in constitution, vigour is such a variable quality, and the size to which the berries may attain depends so much upon condition, that until some knowledge has been acquired the cultivator must to a certain extent be working in the dark. It is true that there are indications which the man of large experience understands, so that he can tell what the coming crop will be; and this experience also guides him in the application of the right kind of stimulant to use for supplying what is lacking in the border. The berries should be thinned whenever it is ascertained which are taking the lead in the bunch. Some always get an advantage over the others; and it is best to leave those, cutting out the weakly ones and such as have thin stalks. In very nearly all cases with large-berried Grapes, such as Black Hamburgs and Buckland's Sweetwater, two-thirds of the berries may be cut out. In no case should two bunches be left on one shoot or branch, for one good bunch is of more value than two inferior ones. Inferiority will be the result if over-cropping is indulged in,—and leaving two bunches upon one branch may be safely called over-cropping. Great care should be used in thinning

the berries, for the skin of the Grape in its young state is very delicate and shows the least touch, sometimes in the form of rust on the outer cuticle, which clings to the berries all through their growth and afterwards does not depart from them. The berries should not be handled, especially by those having sweaty hands, neither should they be touched with the hair or cap or anything warm ; in fact, to have the Grapes in the highest possible condition they should not be touched at all. A small bit of smooth stick may be taken in the left hand, and the scissors in the right. The little stick can be used to elevate the shoulders or parts of the bunch to bring it into position for the right hand to operate upon with the scissors. Sometimes a clean, soft kid-glove is used on the left hand.

COLOUR AND FLAVOUR.—These are usually combined when the fruit is in perfect condition. If one is absent or only imperfectly represented the others are generally deficient. For instance, if there is good colour and bloom there is nearly always very fine flavour, because the presence of colour and bloom denotes high finish, and flavour is present as a matter of course. The word “condition” as applied to man or animal is a very expressive term, and is as full of meaning when applied to plants. Condition as applied to vines means perfect health ; but a vine may be in perfect condition and yet the Grapes, if unskilfully treated, may lack colour and bloom. To put colour on Black Grapes requires a buoyant atmosphere night and day. To meet this want, as soon as the first berry begins to change, the night ventilation is increased, using a little more fire-heat at first to prevent any sudden drop in the temperature. Black Grapes will lay on colour and bloom under a dense covering of foliage ; indeed, they do not colour well without a fair screen of leaves to shelter them from the fierce rays of the sun. On the other hand, what are called White Grapes require exposure to the sun to get that glowing amber tint so much desired. The bloom of Black Grapes is the most difficult thing to define, though it may be summed up in the one word “finish.” No one can say what particular mode of treatment has produced it ; and when displaced (which a mere touch will do) nothing can restore it again.

CHAPTER II

The Late Vinery.—A span-roofed house will be suitable for late work ; but whether it be a lean-to or a span-roof it should be as roomy as possible, or as the requirements demand. There will

be less fluctuation of temperature in a good-sized house than in a small one, and in winter less fire will be required to keep out frost. The roof should not be too flat, for although, so far as regards the growth of the vines, the angle of the roof is not very important, yet a moderately steep-pitched roof is best for carrying off the water quickly, and preventing drip, which is often very destructive to Grapes. If the wall-plates are built upon 14-inch piers there will be less obstruction to the free passage of the roots when they want to go outside. A house 20 feet wide may have a 6 feet path down the centre, with 7 feet beds on each side, which may be raised 1 foot or 15 inches above the ground-level. If the vines are planted inside and well attended to, the 7 feet of border inside will be enough the first year. The second year a piece of border may be made outside, to be increased as circumstances may require. Good sound loam should form the basis of the borders, and if possible it might be taken from a limestone strata; but what I have written about the borders of the early vinery will be equally applicable here.

KINDS TO PLANT.—The Muscat of Alexandria is undoubtedly one of the very best Grapes, though not so late as Lady Downes, Alicante, and Gros Colman. I have generally found that to do Muscats well requires rather more body in the soil than for the Hamburgs and Sweetwaters. If the loam is light a dressing of clay will help it very much, and give substance and weight to the wood. The Barbarossa is a good keeping Grape, carries a large bunch, has a hardy vigorous constitution, and is free from most of the defects, such as shanking, spotting, etc., which many other Grapes are subject to. The best time to plant is just as the buds have broken, the vines having been brought on without artificial heat—assuming, of course, that plants of at least one year's growth are planted. If they are of the same season's propagation they may be planted in summer. All late-keeping Grapes are thick-skinned; in fact, that is the cause of their keeping. To ripen them well artificial heat is necessary, and it is better to use the fire in spring than in autumn. If started, say, not later than the first week in March, they should be ripe in October, or nearly so. A little fire again in autumn, especially in dull weather, will be desirable to finish off the fruit and ripen the wood, the latter point being as important as the former. As regards the application of moisture I beg to refer my readers to what I have said about the early vinery.

THE EXTENSION SYSTEM.—If we plant a dozen vines in a house, though they may perhaps be all of one size and of the same age when planted, before the end of the first year they will mani-

fest signs of inequality. Some will have acquired more substance, and developed more vigorously than others; and it would be only wise to take advantage of the capacity for work which the strong vines possess and remove the weaklings. Perhaps the term "extension system" gives as good an idea of the process as any other, but it seems lacking in expressiveness, because the extension is only of a limited kind. When the house is full there cannot be any more extension. I should think, perhaps, that every gardener of large experience has either had charge of places where a single vine was filling a whole house, and which was of considerable age, or could point to places in every county in England where such treatment has at some time or other been carried out. The more growth a plant makes the stronger it becomes. This may sound paradoxical, because size does not always give strength, and much depends upon the way in which the structure has been built up, be it man, beast, or plant.

SPUR v. ROD PRUNING.—This matter of pruning is intimately connected with the system of training referred to above. When the growth is restricted—*i.e.* when the branches are confined to a particular space—spur pruning is universally adopted, and it answers fairly well when the roots are near the surface. But if the roots run down to the bottom of the border or beyond, the wood fails to ripen well, and the bunches are fewer in number, and have long stalks and straggling habit—in fact, they present the usual symptoms of vines out of condition. The best remedy is to lift the roots; but if this cannot be done the evil may be mitigated by training up here and there, as opportunity offers, a young rod or two, to introduce new blood and vigour. This is adopting the rod system from necessity. Some people adopt it from choice, carrying it out systematically by leading up a certain number of rods annually, and cutting out the same number of canes which have first borne fruit. In competent hands all systems of pruning and training are successful, and the rod system certainly gives the cultivator a little more control over shy bearers—the Buckland Sweetwater, for instance. Where the spur system is adopted, if the vines are in good condition there is no necessity for leaving long spurs. One or two eyes at the most will be enough, especially with such free-bearing kinds as the Muscat, the Hamburg, etc.

SUMMER MANAGEMENT.—This will consist in disbudding, stopping, and tying down and removing the laterals. Unless some reason exists to the contrary, this should be done regularly, when they can be rubbed or pinched off. The supply of moisture to the roots must be abundant, especially during the growing

season ; and the water will be an excellent medium for conveying to the roots any stimulant the plants may need. It is possible to over-feed, but vines will take up a great deal of nourishment at the time the Grapes are swelling without being surfeited. This is a matter which each must discover for himself, for it is impossible to gauge the capacity of vines for useful feeding without personal knowledge. It may be safely conceded that large gouty-looking berries which lack colour have been overdone in the matter of stimulants. This is where judgment should come in. Some people can never leave well alone. They have been watering, say, with guano, or some quickly-acting stimulant ; they can see the rapidly-swelling berries, and fancy, as they are on the right track, that they cannot go too far. Moderation in the use of stimulants should be insisted on, until the capacity of the plants for employing it profitably has been rightly estimated. The application of fire-heat, for the purpose of giving the thick-skinned sorts a good start, is very desirable, and it should not be altogether discontinued till the weather has settled down, in the end of June or beginning of July. Regularity and steadiness is better in every case than working by fits and starts. A flue is not a bad thing for warming a late vinery, even though it be old-fashioned. It is possible, sometimes, to take the flue from some other building through the late vinery. In such case there must be a damper in the flue to shut off the heat from the house when not required. When in good condition the flue gives off a nice dry, genial warmth, very suitable for a late vinery, and is very economical, for, if rightly constructed, it will burn anything. The ventilation and the supply of atmospheric moisture are two of the most important items in their summer management, for, no matter how the border may be made, unless the interior management be right the result will not be satisfactory. To give tables of temperature would not exactly meet the case, because what is really needed is intelligent supervision. For instance, in admitting air, we will say, on a spring or summer morning, one man may keep the house shut up and steaming with moisture till the thermometer reaches a particular figure, and then, by letting down the lights too far, let in a rush of chilling air, which does a lot of mischief. Ventilation should be gradual, and ought to begin early. The openings should be small at first, but increased as the sun gains power upon the glass. If taken in time, the air will gradually be changed without creating any draught. In the afternoon the air should be reduced in like manner by degrees, and whatever forcing is done with sun heat should take place in the afternoon when the atmosphere in the house is sweet and pure. If the thermometer in the afternoon,

shortly after the house is closed at four o'clock or so, should run up to 100°, no harm will be done; but whenever a high temperature is permitted there must be abundant moisture in the atmosphere. This atmospheric question is a most important one. A heavy, saturated atmosphere, if it continues long without the stimulating effect of sunshine, means stagnation and mildew, and soft flabby leaves, which, when the weather becomes hot, in July and August, will probably fall a prey to red-spider. Where the ventilation is intelligently carried out, the leaves are strong and healthy, and neither red-spider nor mildew find a lodgment on them. But no amount of writing can tell everything. Many things must of necessity be learned by experience.

RENOVATING OLD VINES.—When vines get out of hand, nine times out of ten the cause must be sought for at the roots. If from any cause the roots of the vine leave the surface of the border, which is under the warming and sweetening influence of the sun, and descend to unknown depths after moisture, one may be sure that at no distant day there will come long-jointed wood, long-stalked bunches of Grapes, with many-shanked berries. When this state of things comes to pass prepare a lot of turfy soil, mixed with some crushed bones and old mortar or plaster. Then open a trench along the border right down to the bottom, wheeling the earth taken out to some other part of the garden, where a top-dressing is required. This trench should be 4 feet wide, and all roots found in it may be cut clean off. Having obtained a clear space the length and depth of the border, commence with forks to loosen and remove the remainder of the earth, working upwards from the trench, saving all the roots by turning them back and covering with mats to keep them fresh. It is best to do the border in sections if the house is a long one, otherwise it may be all taken at once. As soon as the border is all cleared out and the drainage put right, fill in with the prepared soil, lay the roots out straight near the surface, covering over all with a mulch of rotten manure. If the border is over 12 feet wide only a part may be made at first, the other portion to be added in a year or two, or when more support was required. If everybody could be convinced how easy and beneficial it is to lift vine roots, no one, I am sure, would put up with shanked or unsatisfactory Grapes. The lifting may be done at any season when the vines are not in active growth. I have lifted vine roots at all times from September to March, and I do not know that I have any preference.

BOTTLING THE GRAPES.—It is a distinct advantage to be able to cut the Grapes soon after Christmas. It gives an opportunity to prune and clean the vines, and allows a longer period of rest,

because after the Grapes are cut the house may be thrown open and kept cool till March. The bunches of Grapes should be cut with a good piece of wood from the bottom of the branch, which will be inserted in a bottle of water containing a small quantity of animal charcoal. The bottles, each containing a branch, from which hangs a bunch of Grapes, are placed in a slanting position in racks, so that the bunches hang clear of everything. The Grape-room should be kept at a regular temperature of 53° to 55° , and must be so ventilated that no moisture can lodge on the berries.

CHAPTER III

The Amateur's Vinery.—The culture of Grapes under glass is not a very old business, for at the beginning of the present century Forsythe, the Royal gardener of the period, speaks of open-air Grapes being sent to the Royal table. Anything which creates a genial atmosphere increases the value of the crop of Grapes. I have seen good Grapes grown in a turf pit with nothing but glass lights laid across the banks. When it was fine every other light was tilted up during the day, being closed again at night. Though good Grapes have been grown in very unlikely-looking places, still it is well, when one has any choice in the matter, to have a light, well-constructed, properly-ventilated structure. Light, with abundant means of ventilation, must be insisted on. Except for an early crop a span-roofed house is a desirable form, because it affords plenty of light and a good length of rafter to train the vine rods to.

The vines may either be all planted on one side and trained over, or they may be run over alternately from each side. I recollect an inexpensive kind of vinery that came under my notice some years ago, which was built and entirely managed by the amateur himself; it produced Grapes of a superior quality. There was not a brick used in its construction. The wall-plates were laid on the tops of Larch poles, which could be had cheaply in the neighbourhood. These were firmly fixed in the ground 4 feet apart on each side. The space between the wall-plates and the ground was boarded up, openings being left about 4 feet apart near the ground line for ventilation. There was an opening all along the ridge for ventilation also, which was protected by a movable cap that worked with a lever. There was no upright glass on the sides, but the ends, except 3 feet at the bottom, were glass; and the roof had rather a steep pitch, for the purpose of getting rid of the water quickly. The vines were trained to wire fixed 18 inches from the glass. The lights were made at home by a carpenter at

so much per foot—about 4d. I think—and were glazed by the owner himself; and altogether the house was very cheaply and well built. This happened fifteen years ago. In the execution of similar work now a different system would probably be followed. Painting and repairing is always a heavy item. In building vineries for amateurs nowadays, some plan should be adopted which will do away with painting, and, as far as possible, make an imperishable structure. Some time ago a market-grower told me that he finds it cheaper not to paint. He builds with the best material he can get, and when the wood decays he takes out the glass and rebuilds with the money saved by not painting. Of course the dilapidated appearance the place has when wearing out, from no paint being used, would be distressing to a sensitive mind; but he says he cannot afford to be fastidious. I have no doubt that in a short time horticultural buildings will be erected of imperishable materials. Much improvement in this direction has already been effected, and the work will doubtless go on.

THE GROUND VINERY.—This was invented by the late Mr. Rivers, and was for a time very popular. It was simply a long narrow span-roofed frame, just wide and high enough to train one vine along under the ridge. I daresay it met a felt want, but it has been superseded now by a loftier, wider frame, called, in technical phrase, the “Three-quarter span frame.” This, if placed on turf banks with a sunk path down the centre, will make a very nice little vinery, or it may be used for Peaches, Figs, or Plums, Apricots, and Cherries. If it did not exceed 20 or 25 feet in length, the trees might be planted at one end and trained along the house instead of across in the usual way. If it was desired it would be a simple matter to heat one of these cheap frame greenhouse vineries, either by running a flue along one side or by a small boiler. If only 20 or 30 feet long the flue would be the cheapest and best. Nine-inch earthenware pipes make a very good flue for this purpose, being cheaper and better than bricks. But good Grapes might be grown in this class of structure without artificial heat. Probably better Grapes would be grown in an

UNHEATED VINERY than in a heated one unless great care was used. My experience among amateurs has taught me that they are exceedingly lavish in the matter of heat, often lighting a fire when the plants would have been better without it; and I know that good Black Hamburg and Sweetwater and Muscadine Grapes can be grown without artificial heat. But the sun’s warmth must be utilised to the utmost. By this I mean that the house must be closed early in the afternoon, and be damped to fill it full of genial vapour. Shutting up early in the afternoon in

sunny weather tends to help everything on marvellously. If the syringe is used the heat enclosed in the house by early closing must be strong enough to dry the foliage before darkness sets in, for if damp remains on the leaves all night the green tissues will decay, and the organs which are situated there will not be able to perform their allotted work. I may say, also, that early opening is as important as early closing. As soon as the sun strikes on the house in the morning with any force, so as to cause a vapour inside, the ventilators should be opened a little to let the vapour escape, to be replaced with sweet, fresh, wholesome air. This is very important, for a damp stagnant atmosphere is a precursor to most of the evils which can be traced to faulty internal management. A little chink of air early in the morning, say by six o'clock, or if a little ventilation can be given low down, close to the ground line, on the southern side of the house last thing at night, the roof ventilators need not be opened quite so early in the morning. When a house containing vines is shut up till eight o'clock in the morning in spring or summer-time something must go wrong. Of course the best built house is not air-tight, but modern houses are less exposed and less influenced by external changes than old-fashioned houses were years ago. The details of vine culture are the same under all conditions and circumstances. The stopping, tying, thinning, watering, etc., are the same if the vine is growing in a structure with turf walls as if the very latest improvements were adopted. The person who brings his intelligence to bear upon all he does will not long be bound down altogether by cut-and-dry rules. Promptitude in everything is of the very first importance. If the young vine shoots are allowed to ramble on with their tendrils clinging to everything until they become a perfect thicket, the amount of green which will have to be cut away will represent the wasted effort, which, if the stopping had been done earlier, would have been used up in a profitable manner. So it is with the watering and the use of stimulants—act generously, and promptly meet the need as it arises. If the border is well drained in the season of active growth there will be no danger of overdoing it in the matter of watering.

VINES IN POTS.—This is an interesting way of growing Grapes; not only do they bear well in small pots, comparatively speaking, but when ripe the plants can be moved, and used in any system of room or table decoration if desired. If the vines are raised at home there must be a light position near the glass to place them whilst making and maturing their growth. If the requisite conditions as to light and warmth are present, and the cultural attention is right, there should be no difficulty in growing the

canes one year and fruiting them the next. Ripe Grapes have frequently been cut from vines in pots from sixteen to eighteen months old from the eyes. To do this there must be no hitch in the work from the time the eyes are put in, in January or February, till the Grapes are ripe the following April or May. The eyes may either be started in sods of turf or in single pots, in a brisk temperature of from 60° to 65° at night; and all advantage possible must be taken of the sun's warmth by closing early in the afternoon. As soon as root action is fairly vigorous, and the young canes are moving rapidly upwards, they must be placed on a shelf where the young rods can be trained to wires within a foot or so of the glass. A shelf at the back of a lean-to house will do very well, training the rods downwards. Firm short-jointed canes are better for forcing than thicker wood, if less firmly built, by being less exposed to light. In all forcing (and the preparatory work is clearly a part of it) light in abundance is absolutely necessary. The young canes should be stopped when they have reached the full fruiting length, which may be 6 feet. The laterals should be pinched back regularly to one leaf in order that none of the plant's energy may be wasted; and as soon as the growth has ceased, and the requisite impulse been given to maturation, the plants should be moved to a warm south wall in the open air, and tacked up to it to finish the consolidation. When the leaves fall do what little pruning is required, and start forcing in November if the Grapes are required early. Some cultivators prefer to force the vines without repotting, on the assumption that to repot tends to disorganise; but this need not be feared, as I have often repotted vines before forcing began, and shifted them into large pots or boxes, when the Grapes were set, with pretty much the same result. I have also plunged the pots, without repotting, into large pots, filling in the space with turf and manure. Another plan, and a good one, is to enclose the pots with wire netting, filling in with compost, into which the roots soon work. Whatever plan is adopted the object is the same, viz. to supply the plants with just the food they require—*i.e.* to place it within their reach, and the roots will soon find it. Twelve-inch pots are a good size for fruiting pot vines. They may be turned out into troughs or boxes at the beginning of the forcing season, if this plan is more convenient, instead of repotting or enclosing them in wire netting, or trying by any other plan to supply the food they need. It is best to raise young plants every year, although, if they are not too heavily cropped, and are supported by artificial stimulants, a second crop may be taken the following year, or a selection may be made from the healthiest and strongest.

DISEASES AND INSECTS—Of the former, perhaps, shanking and spotting are the most common and disagreeable. Up to a certain period in their growth the Grapes may look healthy and flourishing; then suspicious discolouration of the stalks of the berries are visible, which gradually assume a darker tint; the berries become limp and cease to swell, their colour becoming a dingy red. I suppose everybody who has had a vinery knows what this shanking is. Speaking generally, it is caused by a want of support at a critical period in the growth of the Grapes—at the commencement of the last swelling, and when a large demand is being made upon the energies of the plant. Whatever may have led up to it, deficient root-action is the primary cause. If the drainage is out of order—if the border has become sour and pasty from heavy manurings—if the roots have descended too far down so as to be drawing their supplies of moisture from a colder strata—if, in short, there is any disorganisation of the roots which prevents them keeping up the supply of nutriment to the bunches of Grapes at all times, but especially during the early ripening period, shanking ensues. Often irregularities in cultural details may weaken the forces of the plants and lead to shanking. Permitting the lateral growth to extend beyond due limits, and then cutting all back at once, has been known, by the severe check it gives, to induce shanking, or rather to lead up to that condition of health which precedes it. On the other hand, very close and severe pinching has, by its dwarfing tendency, the same effect. Drought will produce shanking, though it is not difficult to distinguish between the shanking caused by drought and that produced by a wet sour border. Shanking and spotting are sometimes attributed to unripe wood, but then unripe wood very often proceeds from deficient root-action; and root-lifting in both cases is the proper remedy, and when brought back near the surface everything should be done to keep them there. On no account should anything be planted in a vine border, whatever space the border may occupy. In the majority of cases, if the roots were more thought of, the borders need not be so wide. It is very rare to find these wide borders so well furnished with roots as they might be. Fill the border full of roots, and feed them well to keep them there. In dry weather rich top-dressings and liquid manure, with artificial stimulants in moderation, will be the means of keeping the roots in health, and enabling them to perform the work they are required to do.

Scalding causes injury to some kinds of Grapes. Muscats and Lady Downes suffer from it about the time the berries begin to ripen. Just as the Grapes begin to colour, the sides of the berries

cave in, as if a severe blow had been struck. Very often this is caused by deficient ventilation early in the morning, or at least that may contribute to it. If the foliage is scanty through severe stopping, the conditions are favourable for its spreading; and a shade should be used on the glass and an extension of the lateral growth permitted. These measures, if taken in time, will check scalding; but often the real cause is more deeply seated, and must be sought for among the roots.

Cracking of the berries can hardly be called a disease, yet it is a great disfigurement, and at the same time a great loss. Like scalding, it shows itself just as the Grapes are beginning to ripen. The berries of the Madresfield Court Muscat sometimes crack a good deal. Too much moisture following a dry time may cause the skins of the berries to burst by the sudden pressure brought to bear upon the contracted cuticle. The difficulty may often be overcome by giving the vines more work to do, leaving a heavier crop, and allowing a larger development of leafage. Cracking may be prevented by cutting a notch in the branches below the bunch to check the flow of sap upwards.

MILDEW.—The spores of various kinds of fungi are probably in a resting state, continually floating about in the atmosphere, and when the right conditions for their propagation and growth are met with, they instantly germinate. This being so, as regards mildew on vines it can only obtain a footing where some mistake has been made in the management of the interior of the house, and is generally caused by deficient ventilation accompanied by too much moisture. A stuffy stagnant condition of the atmosphere furnishes a proper home for mildew; and if, at the same time, the roots are in a sluggish condition, it will grow rapidly, and eradication will be exceedingly difficult. The usual remedy for mildew in all its forms is sulphur. Sometimes the fumes arising from it when painted on the hot pipes will be sufficient. When this fails it should be dusted on the affected parts, and allowed to remain till the fungi are destroyed. The cause also must be ascertained and removed. In the winter-dressing immediately following, a good deal of sulphur may be used in the washing of the house and the vines to kill any dormant spores at the moment growth takes place, not waiting till the effect of their growth is seen on the Grapes before applying the remedy.

INSECT PESTS.—Of all vine pests the red spider is perhaps the most troublesome. This is almost sure to appear in the early houses unless the atmosphere is in a very even condition as to moisture. Let the house be kept a little too dry, and the red spider soon appears. If its presence is not noticed at once a

lodgment is soon effected, from which it is difficult to drive it before much mischief has been done. Painting sulphur on the pipes, and shutting up early with a saturated sulphur-impregnated atmosphere, are the best remedies. It is most important to remember that in dealing with mildew and red-spider a stitch in time saves more than nine.

MEALY BUG ON VINES.—When the vineries are kept solely for the vines, there is not much trouble with the mealy bug. Now that every house has to accommodate plants in winter and spring, if at no other time, it is difficult to keep this pest out of the vineries. The only effectual cure is to stamp it out thoroughly, and keep it out for the future by banishing all stove plants from the house. As soon as the leaves fall and the vines are pruned, the house must be thoroughly cleaned, all woodwork painted, and all walls lime-washed. The vines must have all loose bark removed, be well scrubbed with a brush and a strong solution of soft soap and water, and then painted with a powerful insecticide. In the cases which I have dealt with I have used Gishurst compound, 8 oz. to the gallon of water, mixed with sufficient clay to give it the consistency of paint, rubbing it well into all the cracks and crevices. Gas-tar, mixed with clay in the same manner, has been highly recommended by men whose position entitles them to be heard with respect and confidence; and though I have never tried it, I should have no hesitation in doing so if I desired a new remedy for bug on vines. But, whatever is used as a dressing, constant watchfulness is necessary all the next spring and summer, for some of the eggs will hatch off and produce lively, perfect insects. When the sun is warm in spring, the bugs, if any are left, will travel along the rods, and a keen observer will easily discover and destroy them. For want of this close attention and care in spring, when their numbers are few, the opportunity for utterly destroying them passes away. Thrips and green-fly are occasionally found in vineries; but they are easily kept under by fumigating with Tobacco.

The Phylloxera has not done all the mischief in English vineries which it was feared would ensue from its importation into this country. It has been found comparatively easy to stamp it out; in fact no one need tolerate it unless they like. But if it should appear the best plan is to destroy the vines in the house, clear out the border, and start afresh with all things clean and new. Unless vines are obtained in a promiscuous manner from unknown people and places, the *Phylloxera* need not be imported at all.

CHAPTER IV

The Early Peach-House.—When well grown and ripened few things are superior to a good Peach, and with the aid of glass it is not a difficult matter to keep up a succession from May till October. The old-fashioned lean-to is still the most useful form of house for early forcing, as well as the most economical. A good-sized house would be about 30 to 40 feet long, and from 16 to 18 feet wide; height of back wall about 15 feet, and height of front to gutter 5 feet, the upper 3 feet of the front to be glass. The ventilation must be ample, and should include openings near the apex of the roof, and also near the ground line. It is very desirable to secure plenty of openings for changing the air, even though all may not be required except in very hot weather. Good Peaches and Nectarines have been grown trained in various ways, with the trellises ranged at different angles and at varying distances from the glass. I had for a number of years the management of a house where the trees in front were trained on a flat trellis; they grew and bore well, and the trees on the back wall had full light. If the trellis is fixed near the glass the back wall is too much shaded for the trees to do well. To make the best use of the early house the front trellis should be half circular, and far enough from the glass and the back wall to permit sufficient light to reach the back trees and flavour and colour the fruit; or else the trellis should be fixed to the roof, and about a foot from it, reaching through to the back wall, utilising it for the growth of Oranges or Lemons, or something that will produce flowers for cutting. One advantage of having a shorter trellis in front and a set of trees on the back wall, is the greater variety which may be planted. A Peach tree, where it does well, will cover an immense surface, and bear many dozens of fruit; but if the family is small this is not an unmixed good. No one cares to have twenty or thirty dozens of Peaches ripe at once. It is more useful to have trees of smaller size, producing a greater variety of fruit of a successional character. Of course the expedient of budding several sorts on one tree may be adopted, but I still think it is better to have them separate. Having decided how the trees are to be trained and fixed to the trellis, the next business is to prepare the border, which should consist of maiden loam from an old pasture if possible. I know there is often a great difficulty in obtaining this. If it has to be purchased there may be some excuse, as one may hesitate at the expense; but if it can be had

at home for the digging I think it is a very shortsighted policy to withhold it. If the old soil excavated is carted to the place from which the turf has been cut, levelled down, and sown thickly with Grass seeds, as good if not a better sward will be obtained in two or three years, and the object is worth some little sacrifice. The border should be excavated about 3 feet deep, the necessary drain should be run along the front, and, if the subsoil is bad, 4 or 5 inches of concrete should be placed in the bottom. When that has had time to get dry and firm, the border may be made—about $2\frac{1}{2}$ feet will be a good depth for the soil, and 6 inches or more in damp situations may be above the ground level. The front wall of the house should be built on arches. The border should be made in autumn, and the trees planted as soon as the soil has had time to settle. If bearing trees can be lifted from the walls at home I should prefer them to those purchased, and a crop can be had the first year. There will be no difficulty in accomplishing this if the trees are lifted carefully and planted early in autumn; but if young trees have to be purchased in order to furnish the house quickly, dwarfs and riders or standards may be planted alternately. No manure, if the soil is maiden loam, should be added. When more support is needed, liquid manure can be given, or artificial stimulants may be employed. If the border is made too rich the trees make gross wood, which fails to ripen, and the blossoms fall instead of setting. When this occurs the roots of the trees should be lifted in autumn to give them the requisite check. During the first year the young shoots should be laid in regularly, about 6 inches apart, pinching back laterals to one leaf. In some cases the laterals when well placed may be laid in to furnish the trellis. A genial atmosphere should be maintained, and the foliage must be kept clean and free from insects, red-spider being most to be dreaded, especially if hot weather sets in, and the atmosphere of the house be kept too dry. As autumn approaches everything possible should be done to induce early ripening without giving any decided check. A free ventilation night and day will conduce to this—less water will be required at the roots, but anything approaching absolute dryness must not occur. When growth has ceased, and the young wood is putting on the red tint some cultivators like so much to see, the lights, if it be convenient, may be taken off, and a full exposure given. That may not always be possible, but it is a good plan, giving the trees a more perfect rest. This will complete the first season's work, and when the leaves fall what little pruning is required should be done, and the trees washed with Gishurst compound, 4 oz. to the gallon of water, applied with a sponge to the small branches, drawing it carefully

with a forward motion only ; never backwards, or some of the buds may be injured. The thick old branches may be washed with a brush. The pruning will consist in thinning out branches where too thickly placed. When the trees get older this must be done with a fearless hand. If the wood is well ripened very little shortening will be necessary. Under glass the Peach generally ripens all its wood ; therefore only the weakly parts of the branches should be shortened a little, always cutting to a wood bud.

FORCING THE PEACH.—If the preparatory work has been well done—if the blossom buds are there, strong, healthy, and vigorous—nothing but gross mismanagement can prevent a crop of fruit being produced. To have ripe Peaches in May the house should be closed for forcing early in December. I need not say anything of the importance of cleanliness in the building itself, as that should be a *sine qua non* in all fruit-growing houses. If the inside is not painted, the woodwork should all be scrubbed with soap and water, and the walls lime-washed. No one unwilling to take this trouble deserves success. Insects are often troublesome in the best-managed places, and to neglect the cleaning at starting is to ignore the means placed in our hands for getting rid of the nuclei of some of our troubles. There can be no safety when forcing Peaches in extremes of temperature, especially in the early stages. Too much heat or excitement at any time before stoning may make the fruit drop. The first fortnight the house may be closed at night, and ventilated in the daytime when the thermometer rises above 55°. The borders should be examined, and if at all dry a good soaking of liquid manure, with the chill taken off by adding warm water, should be given. The examination of the border must not be a partial one, for dry spots, especially near the trees, may exist when other parts of the border are quite moist. Stirring up the surface with a fork will disclose these inequalities, and at the same time a top-dressing of turfy loam, with a little of some artificial fertiliser mixed with it, is beneficial, and adds force to the trees and size to the fruit. Even when the trees are apparently in no urgent need this assistance is desirable ; in fact, we should not wait for this urgent necessity to arise. The true and right course in dealing with fruit trees is to anticipate their wants, and they will thus always be in a condition to do all that can reasonably be required of them without loss of vigour. Fires should be lighted at the end of a fortnight, and forcing should go on steadily and regularly ; but the slower and steadier the start, the stronger the blossom buds will break. A night temperature of 45° will be high enough until the blossoms begin to expand ; then it may be

advanced to 50° or 52° , with an increase of 10° in the daytime, or more if the sun shines. When the Peaches are set the temperature may be raised a little, say to from 55° to 58° at night. With the most careful stoking it is possible that a sudden change of wind may cause the thermometer to run up above these figures. When that is the case a little air should be given to keep down temperature; in fact, if a little ventilation near the ground line could be kept on always, without causing a draught, it would be beneficial. In tying the branches of the trees to the wires, room must be left for them to swell, especially in the case of young trees whose growth is rapid. Tight ligatures are often injurious by cutting the bark, and such injuries will, if the predisposition exists, produce gumming. During the time the buds are swelling, the syringe, with a fine rose, should be used twice a day, morning and afternoon, to dew over the trees, letting it fall in the form of very fine spray. Heavy syringing is not required at the dull season, as saturated borders are dangerous, and on dull cold days less moisture will be needed. When the blossoms expand a buoyant atmosphere must be created by a perfect state of ventilation, with just enough artificial heat and a limited amount of moisture. Usually there is no difficulty in getting the blossoms to set under such conditions; but there are various ways of disseminating the pollen of the flowers in the fertilisation of the blossoms of Peaches, and so important is the crop that even if it be necessary to use the camel-hair pencil to each individual blossom it should be done. If the weather outside is bright and sunny, and the air consequently dry, the flowers will set more freely than when the atmosphere outside is damp. Very frequently, under the former condition, the blossoms will set well with only a shaking of the trellis in the middle of the day when the flowers are dry. The syringe, too, in judicious hands has during a week or two of bright weather been brought to bear with advantage, effectually scattering the pollen grains, and causing the fruit to set thickly; but the brisk buoyant atmosphere is indispensable. When the blossoms are well set, damping in the morning and afternoon may take place again on fine days, and as soon as the quality and character of the young shoots can be fairly made out,

THE DISBUDDING may begin, removing first all fore-rights, taking care in thinning the side shoots to leave one at the base to keep up the supply of young wood in the tree, and a leader to draw up the sap, and for the purpose of extension. Sometimes in the case of open-air trees more wood is left for a time than is needed, for the sake of the shelter afforded; but under glass this is not required, and with trees in vigorous health the disbudding

need not be delayed, but may be done promptly. When Peaches set thickly some of the young fruits must be thinned off early ; but the final thinning need not be given, unless we are quite sure of our crop, till the stoning is finished. Of course, where the trees behave themselves, leaving more fruits on than are intended to remain seems wrong in principle, and the practice can only be defended because in the case of a tree which casts its fruit it is impossible, until the critical period of stoning is over, to tell which fruit will fall and which will not. After the stone is formed in the fruit, more pressure in the shape of additional heat may be given if necessary, but from 60° to 63° of night temperature should be the maximum. Tying in the young wood is a detail the necessity for which is so self-evident that I need scarcely refer to it here. The syringing should be continued in suitable weather till the fruit begins to colour, especially if there are any signs of red-spider. The supply of water to the roots, in which some stimulant is dissolved, should be equal to the trees' wants, and the water should always have the chill taken off. It is impossible to say what should constitute a crop of fruit, as the burden should be made about equal to strength and capacity. Some cultivators, when very fine fruits are required, content themselves with one fruit to the square foot, others hang them on much closer. But this is a question for individual decision. I may say here that firmness of root-run is beneficial to all stone fruits. If the border has been rightly constructed it can hardly get too firm, although, of course, it should not be trodden when wet.

TO GIVE FLAVOUR there must be abundant ventilation night and day during the ripening period. If Peaches grown under glass do not possess the full flavour and lusciousness which a good Peach should possess, the cause in nine cases out of ten is deficient ventilation, with perhaps a wet, sour state of border. As soon as the fruits begin to put on colour, and to take the last swelling, the syringing may cease, and no more water, if the trees are planted in the border, will be required at the roots. Early in the career of the fruit steps should be taken to give it the fullest exposure to light ; the importance of this should never be lost sight of. In thinning the fruits, only those situated on the upper side of the trellis should be left. Again, during the summer management and training, the necessity for the full exposure of the fruit should be provided for, and later on, if necessary, a leaf or two, if they overshadow fruits near, should be removed. In gathering, it should be remembered that the fruit is soft and easily damaged. When nearly ripe the least pinch or bruise leaves a black spot in the delicate flesh of the Peach. The fruits should be gathered two

or three days before they are quite ripe, and be placed in a cool room to finish off. When gathering the fruit from the tree, place the hand over the fruit so that the tips of the fingers clasp it at the base, and bring a gentle pressure there to dislodge it from the stalk. If a gentle pressure does not suffice, leave that particular fruit a day longer. When the fruits are ripening they should be looked over daily, and the ripest gathered. If they fall, even when nets are placed to receive them, they often get injured. When the fruits are all gathered throw the house open by the removal of the lights if practicable—at any rate all the air possible should be given to complete the ripening of the wood. At the same time the syringe should be brought into requisition again to keep the foliage clean and healthy as long as possible, in order that the leaves may die off naturally, and not be forced off prematurely by red-spider.

VARIETIES FOR EARLY PEACH-HOUSE.—Hale's Early, a highly-coloured and good-flavoured American variety, whose merits have been well tested in this country; Royal George, a good old forcing kind; Early York—this is also a good old sort; Noblesse, a well-known, pale-skinned Peach, of excellent flavour. In order to give variety and prolong the season it is often desirable to plant rather late varieties in the early house. When none but early kinds are planted there is a glut for a fortnight or so, and then a scarcity till the next house comes in; but with one or two trees of later kinds planted, this difficulty will be removed. Prince of Wales and Condor are two good varieties for planting in the early house to prolong the season. There should also be a proportion of Nectarines planted, though the tastes and wishes of the proprietor should be considered in this respect. Unless there should be some reason to the contrary, a house containing six trees should have two of them Nectarines. Lord Napier, Pitmaston Orange, and the Pine Apple are good Nectarines. The Elruge also forces well, and is a free bearer, the tree possessing a hardy constitution.

CHAPTER V

The Late Peach-House.—As I shall have a chapter on the Orchard-house, I reserve the culture of Peaches in pots for consideration under that head. The late Peach-house may have various definitions, and include any kind of glass structure in which Peaches can be grown. It may be heated or unheated, though it is always advisable to have a couple of 4-inch pipes run through the house, even if we do not require to use them, as they give a

sense of security which is worth a little cost, and the expense of the pipes is not a ruinous affair. For a small house 3-inch pipes would do. But a late house, which is intended to be forced by the sun only, should be as roomy as possible, and large houses can be built cheaper in proportion than small ones. In the arrangement of the interior of houses for late Peaches, ingenious minds have often got off the beaten track in the construction and arrangement of the trellises. With the view of increasing the training surface, among other plans which I have seen tried is the arrangement of transverse vertical trellises across the house under each rafter. This is not new. Very few things are, for our predecessors have not only written and said all the good things we would like to say, but they have left us at least the germs of all the new inventions. One advantage in the system is, that it leaves the back wall free and fully exposed to the light, and certainly increases the training space. It also gives scope for the planting of more trees, thus securing a greater variety, and lengthening out the season. Even in unforced houses this is important, for when trees are encouraged to grow to a large size the fruit ripens too much together to be made the most of. On this system a house 40 feet long and 18 or 20 feet wide will furnish a training surface for a dozen trees, viz. nine on the transverse trellises and three on the back wall; and these twelve trees, if judiciously selected, should in a cool house give a long succession. This is the only advantage claimed for it, but that quality I think it really possesses. For the production of really handsome well-flavoured fruit there is, of course, no better way than to train the trees within 18 inches or so of the glass. The system of transverse trellises is not so well adapted for span-roofed houses, as there is no back wall to utilise. Still, even here the plan may be made to answer, but the house should not be less than 25 feet wide. A border 3 feet wide should run round the house next the wall. Then should come a 3-foot path, and this would leave a central border of 13 feet; consequently the transverse trellises would be that width, which would furnish training space for one tree on each. The outside border would be furnished with trees, which could be trained to a vertical trellis, running all round the house near the path. Such a house has a pretty and interesting appearance at all seasons, and both trees and fruit would be always under the eye, and easily managed.

VALUE OF MAIDEN TREES.—If young trees have to be purchased, I much prefer maidens for indoors and outside. Trees which have been cut back time after time are very susceptible to gum and canker, and never, or at least rarely, acquire the vigour

and healthy freshness of condition which the unpruned trees do. Of course I do not object to reasonable and judicious pruning, but I contend that the manner in which young trees are sometimes mutilated in their youth is very far from being reasonable or judicious. Having gone somewhat fully into the construction of the border in treating of the early Peach-house, I need not further refer to it here beyond laying some stress upon the necessity of lime to all stone fruits. A mellow loamy soil from the surface of a limestone-bearing strata is the best soil; and if this cannot be had some lime should be added, either in the construction of the border or from time to time as it is needed.

SUMMER MANAGEMENT.—The trees in the late house may be permitted to come on naturally with only just fire-heat enough to protect the blossoms on frosty nights. A good deal may be done by the proper ventilation of the house to regulate the temperature. Some people think that a late house wants no attention beyond a supply of fresh air, but this is a mistake. The ventilation, from the time the blossom opens till the fruit begins to colour, should be as carefully attended to as if the house was forced. And it is especially useful to bear in mind that cold currents of air may be a great source of injury to the young growths in spring. Again, a very great deal of help may be got from the sun, if we lay ourselves out to catch and confine his beams or rays by early closing in the afternoon in the hottest weather in summer. During the growing season the house may be closed and syringed at four o'clock in the afternoon. Earlier in the season it may be closed proportionately sooner; but with this system of early closing should be linked early ventilation in the morning, and, if possible, without lowering the temperature too much, a little night ventilation also from an opening or two at the ground line. These openings for night ventilation may be covered with perforated zinc or closely woven netting, and thus the fresh air will be filtered through, and no injurious draught created. The top-dressing of the borders, the application of artificial stimulants and liquid manure, have been referred to elsewhere, and are just as important in the late house as the early one. The blossoms also will require a little attention when setting, for nothing should be left altogether to chance that we can influence or control. For the most part when the pollen is dry, shaking the trellis will scatter it, and the Peach, as a rule, flowers so abundantly that if a tenth part of the blossoms set there will be a superfluity of fruit. Still, it is true wisdom to do all we can to ensure a good set, as that enables the cultivator to get his crop all on the upper side of the trellis, and have brighter coloured, and, as a rule, better fruit. The disbudding, the training

of the young wood, the removal of laterals, and the thinning of the fruit is routine work, the details of which have already been noticed, and is much the same in all Peach culture under glass. I need only say further respecting it that delay in the carrying out of any necessary operation may have injurious consequences, and in glasshouses the best work only should be insisted on.

THE LIFE HISTORY OF THE PEACH, regarded simply as a fruit, may be divided into periods. First, there is the embryo state in the interior of the blossom waiting for the development of the various organs which have been provided by Nature for its fertilisation, and which are so timed as to reach the proper state for performing the various duties assigned to each at the right time. Trees in good health, with well-developed and well-matured parts, seldom fail to set their fruit more thickly than is required. When Peaches fail to set or drop during their growth there is always a cause—either the trees are out of health or condition, or else the cultural details have been wrong. The second period of life of the Peach is a time of rapid growth, and extends until the formation of the stone begins. Regularity and steadiness should accompany this stage. The external air is often cold, and the ventilation, to avoid the admission of cold currents, requires attention; chilled water only should be used for all purposes, and when the trees are syringed it should be done early enough, if done in the afternoon, for the leaves to get quite dry before night. The stoning period is an important one, and for two or three weeks seems to absorb the force of the tree, for though the work must be going on there is no visible progress. It seems as if Nature was resting, gathering up her forces for the final rush to the goal (though of course we know the work is incessant), and the period, as regards the crop, is a critical one. If there is any defect in the supply of nourishment to the tree, and any dry spots in the border, the effect will be seen now in cast-off fruit. But when the stoning period is past the crop is safe, and it will for a time bear a little more pressure if rapidity is desired, until the fourth or ripening period is entered, which admits of no forcing or hurrying. To obtain fine flavour in Peaches, during the last fortnight there should be ventilation night and day, accompanied by dryness in the atmosphere, and no water should be applied to the borders. It is best to anticipate the perfect ripening of the fruits by a day or two, as in the even temperature of the fruit-room, the fruits, when set out thinly, ripen more regularly and the flavour comes up better. Experience will soon teach even the novice, if he is intelligent, when to gather the fruits so as to have them in the best possible condition. When all are gathered, the trees, if there are signs of red-spider, should

have a good wash with the garden engine, applied forcibly ; and afterwards all the air possible should be given night and day, and water applied to the borders if they need it. It may also be stated as a general fact that absolute dryness for any length of time is good for nothing which has to sustain life. When the leaves are all down the trees may be unloosed from the trellis to allow the air to play freely among the branches, and the motion of the young wood which exposure will give has a beneficial tendency. It is not a natural state of things to brace up for a longer period than is necessary the branches of a tree from which so much is expected. From the time the fruit is gathered, or at least from the time the leaves fall till January, the branches may have freedom.

PRUNING AND TRAINING.—A pruning knife in the hands of a careless or inexperienced man may soon do a good deal of harm. The principal pruning season is in the spring—then the foundation for the next year is laid ; and in autumn the chief work is to clear the way, to remove those branches no longer required, and to lay in those which have been in preparation during summer. The winter pruning may be regarded more as a selecting or regulating period, and such work always requires judgment and care. When the pruning is completed no two branches should be nearer each other than 6 inches, and the process should be so managed that no part of the tree will be destitute of bearing wood ; this, in fact, is the great aim and business of the pruner. Occasionally a branch dies at the bottom ; in that case the next branch above must be dropped down to take its place, and the others opened out to let up a young shoot to fill up the trellis. With Peaches under glass, the wood, unless the borders contain too much manure, seldom fails to ripen ; and therefore, so long as there is trellis room unoccupied, there need not be much shortening. Long shoots, with weak points, will require to be shortened back, and should in all cases be cut to a wood bud, which is easily distinguishable from a blossom ; the latter being round and plump, the former more elongated and sharp at the point. Very often the Peach has its buds in triplets—a wood bud between two flower buds—and it is always safe to shorten back to such buds as these. A leader to every fruit-bearing branch is a necessity, for if there are no leaves to draw up the sap and keep up a constant circulation, the branch dies, and the fruit withers and drops. For training trees on a wire trellis there is nothing better than roffia. It is soft for the trees, and yet strong enough to last one season ; it works easily, just as well dry as wet. Young hands are very apt to tie the branches too tight. This should always be guarded against, as it has an injurious effect upon the trees.

VARIETIES FOR LATE HOUSES.—Bearing in mind the necessity there is for variety, and that it should be of a successional character, I give below the names of some varieties which are excellent. Of late years much improvement has taken place in the sorts of late Peaches. Some of the best late as well as early Peaches have an American origin—Albatross, Barrington, Condor, Diamond, Golden Eagle, Goshawk, Late Admirable, Lord Palmerston, Osprey, Noblesse, Prince of Wales, Sea Eagle, Stirling Castle, and Stump the World. Where there is only one early house for Peaches, and one late house with nothing intermediary in character, it will be better not to begin forcing too early—the beginning of the new year will be time enough; and then by the introduction of some early varieties into the later house, and a few late-bearing trees into the early one, the two may join hands together.

CHAPTER VI

Orchard-House.—When we speak of the progress of gardening we perhaps hardly realise the fact that much of this progress has been owing to cheap glass. Without this there would have been no Orchard-houses scattered over the land, nor yet the masses of bright exotics which we notice in every garden. This, perhaps, in the eyes of some people would have been no loss. Still, in a climate like ours, bright colours have an enlivening effect.

The Orchard-house idea originated in the prolific brain of the late Mr. Thomas Rivers, but the idea as promulgated by him has grown with the exigencies of the time, and now takes the form of a substantial structure of wood and glass mounted on brick walls. There is no economy in the use of inferior materials or workmanship. A house must be well built if it is to hold together, but in the Orchard-houses of the future I have no doubt all perishable materials used in construction will be under cover. Mr. Rivers grew his trees mostly in pots, and recommended that system of culture. On his advice it was adopted by many, but afterwards it was abandoned by some in consequence of the time and labour required. Any given result can be more easily obtained by planting the trees in a border than by growing them in pots. For instance, we will say, "Here is a span-roofed house for late Peaches. What system shall I adopt to obtain the largest amount of fine well-flavoured fruit at the least cost?" If the question is put in that way I do not think the potted trees would find many advocates. On the other hand, if an enthusiast in fruit culture wants a hobby,

and would rather spread the produce of his trees over a considerable period than have too much at once, then, I say, grow them in pots. I know no better way of testing a man's abilities than in placing under his care a house full of potted fruit-trees. There will, of course, be Peaches and Nectarines, and perhaps Apricots, though they do better in a house by themselves where they can be kept cool and have abundant ventilation. Plums and Cherries should be included, as they do well in pots. One of the evils of the system is the crowding of too many trees into one small house, though there is less danger to be apprehended if the trees are thinned out in good time. The Plums, for instance, or some of them, may be moved to a sheltered place out-of-doors when the fruits are set. Watching over the plants, moving this or that tree to a better position, or transferring another to a sunny spot in the open air—carrying out small things which cannot be put down on paper, and originate in the active mind only—are the operations which lead to real success. Again, in the watering of

TREES IN POTS, incessant watchfulness and care are required, for the sins both of commission and omission have to be guarded against. If we trace the career of a potted Peach-tree in its relation to watering-pots through one season, we shall see some of the difficulties of the work. When brought into the house the pruning and cleansing should be done before any buds have swollen much. It is best to operate in January, just as the buds are beginning to move, as this enables the pruner to discover the wood buds which he wishes to cut back to. If the summer pruning is rightly done, there will not be much to do now beyond a little shortening, the removal of snags, and trimming scars which may have been left from the summer work. Whether to plunge the pots or not may be left an open question to be decided by those interested. A tree with its pot plunged will not require so much water, and the roots will be less exposed to changes of temperature. On the other hand the unplunged trees have the benefit of the solar warmth playing round their roots, and if they require more water there are plenty opportunities of conveying gentle stimulants to the roots to swell off and nourish the fruit. The fruit of unplunged trees in careful hands is of superior flavour. Fruit growing is a many-sided business; it has to be looked at from so many different points of view, that a very good case might be made out both for and against the culture of trees in pots. From lack of the power to grasp minute details many have failed, whilst others, possessing that most valuable faculty (which has been called the spirit of genius) of "taking pains," have succeeded without encountering much difficulty. In the culture of trees in pots it is

important that we start rightly. The trees should not be too old. Trees of several years of age have often been cut back too severely in the trade-grower's hands. There is no question, I think, that there is more cutting back of young fruit-trees in the nursery than is good for them. Therefore, if we have time enough, and can afford to wait, I should recommend maiden trees,—great care being used in the selection to ensure that they are budded on healthy stocks, and that the union is a perfect and successful one. Having secured early in autumn a sufficient number of healthy maiden trees, they should be potted in turfy loam, in which a few crushed bones and a little Standen's, or Clay's, or Aimes' artificial manure, has been incorporated, with just a little lime or old plaster. Calcin'd oyster shells are good for the lime they contain. I do not like yard manure, as its tendency is to clog up the pores of the soil, and a better result can be obtained with a concentrated manure. As instructions for the use of each manure are usually enclosed in the packets, the novice can easily follow them. Ten-inch pots will be large enough to begin with.

DRAINAGE.—This should be as perfect as it is possible to make it, for at times in hot weather a good deal of water is needed, and the drainage is a very important link in the chain of success. Too often the man wielding the waterpot is heavily handicapped by the boy who arranged the drainage. The large hole in the bottom of the pot should be covered with one large piece of crock. It should not lie quite flat on the bottom, or some day the plant may become water-logged. On the large crock should be placed a layer from 1 to 1½ inch thick of a size smaller. On these should come a layer of small pieces. I may say, in passing, that these various sizes of crocks, where much potting has to be done, should always be kept in stock, being prepared by the boys in bad weather. The drainage for a 10-inch pot may be about 2½ inches thick—at any rate it should not exceed that. On the drainage place a layer of chopped turf taken from the heap used in potting. Place the tree in the centre of the pot, keeping the collar in the same position as to insertion in the soil which it formerly occupied, and ram the soil in firmly, but take care that none of the roots are injured with the potting stick. I need hardly say that any long straggling roots should be shortened, and all lacerations of the roots received in removal from the nursery should be smoothed with a sharp knife. When the trees are potted they should stand on a bed of coal-ashes or some impervious bottom till after Christmas, sheltering the pots with litter; and if a hard frost sets in scatter a little litter loosely over the tops of the pots also. I have already spoken of their removal to the house in January, and

of their pruning and washing with Gishurst compound. By this time the roots will be active, and will require watering, though not very frequently at first, unless the weather should be bright and drying. The more roomy the house the better, and the less need will there be for artificial heat to keep out frost when the blooms are expanding. Until the trees come into blossom the house may have full ventilation. It is never wise to hurry the blooming, for retarding, if possible, is the better practice; but as soon as the blossoms begin to expand the ventilation should be properly regulated, avoiding draught, as blossoms of fruit trees are fragile things. A genial atmosphere, approaching dryness rather than moistness, kept in motion by as many openings as the state of the weather will permit, is the right condition to aim at.

PINCHING THE YOUNG WOOD.—Though a good deal has been written on this subject, some people are still uncertain as to the right course to adopt. One thing may be stated with certainty, that no hard unbending rule can be right for all trees. Trees of exceptional strength or those of weakly habit must be considered on their merits, apart from general principles. I do not recommend Peaches to be closely pinched. Let them make 8 inches of wood and then remove the terminal bud. The very vigorous trees should be deprived of their gross shoots, and the exuberance directed into less robust channels. That should be done as soon as this tendency manifests itself in any part of the tree. It is an easy matter to control growth if it is taken in time, and the evil habit nipped in the bud. Weakly trees want encouragement, and only a light load to carry till strength is regained, little or no pinching being done till the growing season is far advanced, and then taking out the terminal bud of the strongest shoots only. The object of pinching is to concentrate force. One fruit is quite enough for one young shoot to carry, and if the shoots are permitted to run themselves out unstopped, there is less strength in any given length of branch. The aim is to stop the shoots so as to throw the force into the back buds and foliage. If the pinching takes place too early, the object will probably be defeated, because the back eyes will push out laterals, and those again when stopped will push out laterals in their turn. A continual state of excitement and waste will thus be encouraged, whereas the object should be to induce rest and maturity and form strong flower buds. Plums may be more closely pinched than Peaches, 3 or 4 inches of young wood being quite enough. In all cases a shoot should be encouraged to grow out at full length in various parts of the tree for supplying vacancies and keeping up its stamina. Some annual progress seems necessary to perfect health in all

trees, and this should be borne in mind ; but the whole subject requires a great deal of thought. To give encouragement in some cases and to repress in others, without overdoing it in either case, requires the judgment which is born of experience, and the knowledge which a wide study of the subject only can give.

GENERAL MANAGEMENT.—The directions and suggestions for the late Peach-house may be read as applying with equal force to the Orchard-house. The Plums and Cherries should occupy light positions near the ventilators, but they dislike cold currents of air passing through them, especially in the early stages of growth ; and on cold days, with the wind in the east, this should be avoided. On such days when the sun is shining brightly, and air must be given to keep down temperature, it is a good plan to hang some strips of canvas (through which the air may be filtered) over the ventilators. The disbudding and thinning of both wood and fruits has been amply discussed elsewhere. I will only say further that trees in pots must not be overloaded. Two dozen of Peaches or Nectarines will be a heavy crop for a good-sized tree in a pot. After the fruits are set the syringe or garden engine should be used frequently ; if used in the afternoon always do it early enough to allow the foliage to get dry before night. The night and early-morning ventilation are strong points in a sound practice, —only they want to be carried out judiciously, taking into consideration the state of the weather, size and aspect of the house, etc. As soon as blossoms are fairly set, a top-dressing of loam and manure may be placed on the surface of the pots. More water will be required, and this will induce the roots to take possession of the top-dressing. When the fruit increases in size liquid manure should be given freely, phosphates being more desirable for stone fruits than manures abounding in nitrogen. As the fruits begin to ripen, there must be full ventilation. It will be better in grouping the trees to place the early sorts at one end and the later kinds at the other, with the intermediate ripening varieties in the middle. If this is done the late kinds can be receiving a higher temperature to complete their growth, whilst the early kinds are having full air to flavour the fruit. Sometimes it may be desirable to combine the culture of trees in pots with the planting-out system. If the house is a large span-roofed structure, standard trees may be planted down the central border and trees in pots may occupy the side borders. If the house is not very lofty, pyramidal trees may take the place of the standards. In any case they must not be planted too thickly. One handsome well-developed tree will bear more fruit than if two or three be crowded into the same space. Besides, if the sun and air cannot

penetrate, the fruit will not colour and the flavour will be inferior. If a good border of sound loam has been made, Peaches will succeed for many years without training, beyond what is given by the finger, thumb, and knife. Such trees are usually healthier and longer lived than those pruned and braced up to a trellis; and for a large house it is an interesting way of growing Peaches and Nectarines. There must, of course, be pruning, or in time the trees would get out of hand and become naked at the bottom. But Peaches may be cut back into the old wood, not only with impunity but with benefit. If the potted trees, or any other, have got naked below, cut back sufficiently to bring the tree into a good shape. Encourage growth by giving a genial atmosphere, disbud the shoots not required to form the new head, and in twelve months a handsome fertile tree will be created from the leggy one. The Peach yields to this treatment better than most others, but Plums and Apricots, if the roots are healthy, will submit to it.

APPLICATION OF ARTIFICIAL HEAT.—When the Orchard-house idea was first started, it was considered that artificial heat would not be required; but a riper experience leads me to recommend, especially in the case of small or moderately-sized houses, that some means of warming the house should be available, but only for use in severe weather, to keep out frost.

DISEASES AND INSECTS.—The Peach, like all other fruits, is more susceptible to the attacks of insects and mildew when weakened by over-cropping or neglect in watering, or any other cause. But under glass these various influences should be minimised, as the cultivator has the matter pretty much in his own hands. It is true that almost as soon as the young shoots break forth in spring the green-fly appears, but in most cases he can be kept under by the use of the engine and clean soft water. If this will not suffice, smoking with Tobacco must be resorted to; and it is better to smoke twice, with a day or so between, than to overdo it. The leaves must be quite dry when the fumigator is introduced. A calm damp evening is the most suitable, as the smoke remains longer in the house, and is consequently more effective. On no account must the Tobacco paper be allowed to flare. The morning after the fumigation the trees should have a good washing with the garden engine, to bring down the dead and sick flies. The black aphid is more troublesome to the Peach than the green fly, but it may be got under by using the same means; and it is very important that the matter be dealt with in time. Later on in the season, if the weather be hot and dry, and the water supply has been stinted, either in the atmosphere or at the root, the red spider usually makes his appearance. He is so small that he may at

first pass unobserved ; but he will not remain long unnoticed, or rather his work will soon be observed, if he is present. Red spiders eat all the green matter from the upper side of the leaves first, and then attack the lower side. In a short time, if no means are taken to destroy them, they will cause all the leaves to fall from a tree. The best remedy is pure soft water. Where this is used freely, and the roots do not suffer from drought, there will be no difficulty from red-spider. Sulphur used in the syringing water in small quantities will be beneficial if any spiders are present, and is also the best remedy for mildew, both on the foliage and on the fruit. There are two species of brown scale (*Coccus amygdali* and *C. Persicæ*), but Gishurst compound will destroy them. Where the trees are regularly washed, before growth begins, with a strong solution of this or any other suitable insecticide, the scale will not be troublesome. Sometimes, when the borders are allowed to get too dry, a fungus attacks the roots, especially if any leaf-mould and bits of root or stick are left in the border. The best way of remedying this is to lift out the trees, remove all the old tainted soil, and bring back fresh soil from a new source. It often happens that the borders may be affected in this way without its being known. A tree gradually becomes weakly when there is no ostensible disease, only weakness, which arises from the roots being poisoned by the flaky white fungus which is fast enveloping them. Though in an Orchard-house proper quite a number of different kinds of fruit may be grown together, yet there is no doubt, where it can be done, that it is better to form them into groups ; for instance, I always think Figs will pay for a little forcing in spring to ensure the ripening of the crops. The Cherry, again, and the Apricot do best alone, the latter being very impatient of artificial heat or any stuffiness in the atmosphere. Plums succeed well with Peaches and Nectarines, but Pears and Apples should be grouped together.

A Grape vine may be trained along beneath the ridge, if desired ; but the trees below want all the light. Good Grapes may be grown in an Orchard-house, but they are best when kept separate, if there is the means of doing this.

SORTS TO GROW.—I give below short lists of varieties suitable for Orchard-house culture :—

Peaches—Early varieties : Acton Scott, Early Louise, Hale's Early, Royal George, Early York, Noblesse, Abec, Crawford's Early, Early Silver. Mid-season varieties : Barrington, Bellegarde, Raymacker's, Belle Baeuce, Comice de Bourbourg, Prince of Wales. Late sorts : Comet, Condor, Lord Palmerston, Lady Palmerston, Princess of Wales, Stump the World, Late Admirable.

Nectarines.—Elruge, Early Newington, Downton, Pine-apple, Hardwicke Seedling, Hunt's Tawny, Lord Napier, Pitmaston Orange, River's Orange, Violette Hative, Old Newington, and Victoria.

Plums.—Coe's Golden Drop, Cox's Emperor, Coe's Late Red, Decaisne, Denniston's Superb, Greengage, Huling's Superb, Jefferson, July Greengage, Kirke's, Lawrence's Gage, Pond's Seedling, Prince of Wales, Purple Gage, Reine, Claude de Bavy, Transparent Gage, Victoria, Washington.

I have given a somewhat lengthy list of Peaches and Plums, under the impression that they, or at least some of them, will be grown in pots. I do not think I need give lists of other fruits.

The Moor Park is still the finest *Apricot* in cultivation, and in a bad climate it is better worth a house to itself than some things which are so favoured; but it wants careful management, especially as regards ventilation.

Cherries are a recognised crop under glass, and force well either in pots or as trained trees. The Dukes are, perhaps, more manageable under glass than other kinds. The whole matter hinges upon steady regular treatment, guarding against the application of too much heat, and giving plenty of fresh pure air.

Among *Apples*, which may, where space can be spared, be grown in pots, may be named Calville Blanche, Newtown Pippin, and Orange Pippin.

If *Pears* are grown in pots the late sorts should chiefly be selected.

CHAPTER VII

The Fig-House.—The Fig does well in confinement; in fact, unless we keep control of the roots there cannot be any permanent success, and in the majority of instances this control is as necessary in open-air culture as under glass. The Fig is a delicious fruit when well ripened, is indispensable to a first-class dessert, and continues in season, where a house can be devoted to its culture, a very long time. The White Nerii, or Marseilles, may be ripened under glass early in May. By the time the first crop is over the Brown Turkey will be coming, the second crop of Nerii will succeed the Turkey, and the second crop of Brown Turkey close the season. With moderate forcing the Fig season will last for six months.

MAKING THE BORDER.—There are two or three specially important features in the successful culture of the Fig. The first

is, Never lose touch of the roots. If they cannot be bricked or boxed in, their extremities should be frequently lifted in order to prevent them getting out of hand. Figs are often planted on the back walls of vineries or other structures in which they form only a subordinate feature, but this is not the way to do justice to them. They deserve a house to themselves, and in order to make the most of the house the trees should be forced sufficiently to ripen the second crop in time to thoroughly mature the wood. This maturation of the wood is much aided by the roots being in a proper condition and well under control. The root-run need not be extensive, and may either be altogether inside or altogether outside, with the exception of a narrow border just within the front wall to plant in. The best way of training the Fig is to make an arched trellis a couple of feet or so from the glass and train the trees over it. The trellis should run through to the back wall, for in the case of the Fig it is better to extend a tree which is doing well, and has its roots under favourable conditions, than to plant trees on the back wall. A border 12 feet wide will be ample for a wide and lofty house. Of this space 10 feet should be outside and 2 feet inside—the trees to be planted inside, the roots being allowed to travel outside when they please. The border should lie well up, to obtain the full benefit of solar warmth. The bottom should be made impervious, and the front fenced in with a wall of concrete; but thorough drainage is most important, as at certain seasons a large-leaved plant like the Fig will require liberal supplies of moisture; therefore the drainage must be good. The soil should have for its main staple a good sound loam—from a limestone formation if it can be had; but at any rate it should be of a generous nature, with plenty of body in it—not sandy. It need not be more than from 2 to $2\frac{1}{2}$ feet deep, and the only manure given when first made should be crushed bones. These may be added somewhat liberally, or, say, a bushel to every cartload of loam. Calcined oyster shells, if obtainable, will be beneficial, or old plaster from the pulling-down of old buildings. Whatever nourishment the trees require can be given when they need it in summer by dissolving artificial manures in water and pouring it on the border. Figs may be planted any time under glass from the time the leaves fall till March. In planting, the roots should be laid out within 6 inches of the surface, and the border should be heavily mulched with half-decayed manure.

FORCING.—In forcing the Fig, about the same temperature as is given in the early vinery will be necessary. Close the house at the beginning of January. Keep the night temperature at 45° the first fortnight, but let it gradually creep up to 50° towards the end

of the month. When the young Figs push out, and the leaves burst forth, the temperature at night should be raised to 55° , to be followed about the time the fruits show flower by a rise to 60° . The inflorescence of the Fig, unlike all other fruits, is within the fruit itself, and takes place when it is about half grown. During the time the flowering is in operation a drier atmosphere should be maintained, and if dull weather sets in a little more fire should be used to permit of more air being given. It may easily be known when the flowering of the Fig takes place, as the eye of the fruit expands and exposes it to view.

STOPPING THE YOUNG WOOD.—I have said that there were two or three specially important matters in connection with Fig culture under glass. The first which I laid stress upon—"Never lose touch of the roots"—may in a sense be applicable to all fruit culture. The second—"Stopping the young wood"—is perhaps in its thoroughness applicable to the Fig only, as no other fruit tree will bear a crop on the wood of the same year. The Fig, like most other trees under the cultivator's hand, always starts more shoots in spring than it needs, and the weakest of these should be rubbed off as soon as it can be seen which it is necessary to leave. When the young shoots left to produce the late crop have made five leaves, take the terminal bud of the shoot between the finger and thumb and press it sufficiently to bruise and so far destroy the tissues as to stop all circulation. This course of treatment should be adopted with every shoot on the tree. The shoots of Fig trees bleed a good deal when cut, and the object of nipping the buds, instead of cutting or pinching them off, is to prevent loss from bleeding. Pinching the young wood after a fair development has been permitted tends to fill the trees full of young stubby shoots, which will bear freely. All laterals should be pinched back to one leaf, and no extension permitted beyond. The leaders, if the trellis is not furnished, may be allowed to extend; but the branches must be trained thinly, for the Fig tree carries a large breadth of foliage, and exposure of the wood is necessary to fertility. In the early stages of growth a moist atmosphere should be maintained by the free use of the syringe morning and afternoon, and this should be kept up till the period of flowering begins, when a drier state is necessary. Afterwards the syringe should be resumed till the fruit begins to ripen, when it must be discontinued. The borders, both inside and out, should be mulched with manure, and liquid manure given when help is needed. In October, when all the fruits are gathered, throw open all the lights, and leave them so night and day to complete the ripening of the wood and bring down the leaves.

WINTER PRUNING.—Just before the house is closed for forcing, or about the beginning of the new year, the winter pruning should be done. This should be directed chiefly to the removal of naked old branches whose space can be more profitably filled with young wood. No directions for this work can be given except by some one on the spot; but in the pruning of old neglected Fig trees the knife may be used freely, with advantage, to open up the tree and make room for young wood, for on that alone will the fruit appear. In training the tree the main branches should be laid in their full length first, and afterwards the side shoots should be so arranged in the open spaces as to furnish the trellis with bearing wood. In order to secure well-balanced trees, the whole of the branches should be unloosed from the trellis every year; and after the trees are pruned, before training begins, all the wood should be washed with Gishurst compound, from 4 to 6 ounces to the gallon of water, using a brush for the thick branches and a sponge for the smaller ones. All the paint of the wood-work inside the house should be washed with warm water in which some soft soap has been dissolved, and all walls lime-washed. When a tree drops its fruit there is always a cause, which should be sought for and discovered. Checks and chills will sometimes force the fruit to drop when young, and too much moisture in the atmosphere will, by preventing the proper fertilisation of the fruit, lead to its falling when half grown. Removing a terminal bud of a shoot at the winter pruning has been found of advantage, by throwing back the strength into that part of the branch bearing the fruit. It is, in fact, stopping by anticipation the progress of the tree, in order that the fruit may benefit from the concentration of the tree's force upon its fruit rather than on the manufacture of new wood. Of course the new wood comes later on. It is an expedient which may be adopted in certain cases, but with trees in good condition, having healthy roots near the surface of the border, it is scarcely needed.

INSECTS.—So far as I am aware, in this country the Fig has no disease peculiar to it, for the habit of dropping its fruit prematurely, which some varieties have, may be traced to local causes. The insects which chiefly attack the Fig are the scale, *Coccus cariceæ*, and *Coccus fici*; but unless much neglected, there is no difficulty in getting rid of them by dressing in winter with a strong solution of Gishurst compound, mixing enough clay with it to give the consistency of paint, and painting all the branches, especially filling up all the cracks and crevices. The red spider is sometimes troublesome, and the syringe should be plied vigorously twice a day except when the fruits are all in blossom and

during their ripening. At these times, if the red spider appears, the leaves must be sponged, using a little soft soap in the water. If the mealy bug gains admission to the house it is rather troublesome on Fig trees, but it can be got rid of by using the proper remedies—the same as recommended for bug on vines—following them up persistently till none remain. But, with all the remedies I have seen tried, it is necessary to keep a strict look-out for stragglers all the following spring, as some eggs will escape the winter dressing.

FIGS IN POTS.—If a house cannot be given up to the Figs, so that justice may be done them, and they have to be treated as a catch crop, it will be better to have them in pots or tubs, or even in boxes, as the Fig will grow in anything that holds sufficient soil for the roots to work in. When grown in a pot the Fig has a considerable power of adaptation to circumstances. The trees may be pruned hard back in winter, the pots plunged in a bed of leaves to induce a strong break, the young shoots pinched at the fifth leaf, as I have recommended, and a heavy crop of fruit gathered from the young wood almost as early as under ordinary circumstances the first crop could be gathered. This is a good plan to adopt with good forcing varieties. The first crop, which is often a thin one, is sacrificed altogether, and the energies of the plant driven into what would in the ordinary course be the second crop. Figs may be grown in comparatively small pots, for when pot-bound they will take very strong doses of liquid manure, and rich top-dressings may be easily applied by fixing broad strips of zinc to the top of the pot, and filling in with rich soil. When the plants have been potted on time after time, and have reached the extreme limits as to size, they may have half the roots cut away with a knife, and be potted back into smaller pots, reducing the heads at the same time. I have often done this when they get too large; they do not seem to resent it in the least; in fact, it seems to infuse new life into the trees. It is better not to prune shy-bearing kinds till after the young fruits are pushed out, as one can see better where to cut without sacrificing any fruit. Fig trees in pots will succeed in almost any temperature, if it is only regular. They will do in the Orchard-house, though the second crop does not ripen without fire-heat. A fair amount of success may be obtained in the vinery or the Peach-house, and many a chance dish can be obtained in this way; but Figs are as well worth a small house to themselves as Peaches and Melons. When all the fruits are gathered and the leaves are falling, the plants may be placed out in the open air, in a sunny position, to complete the ripening; but they must be housed again before much frost commences.

Figs in pots need not be repotted every year, unless much root-bound; but as much of the top soil as possible should be removed, and fresh compost added. Turfy loam from the top of an old pasture, mixed with a fourth part of old horse-droppings, and a good sprinkle of bone-dust and old plaster or mortar, all thoroughly intermixed, will form an excellent compost, with liquid manure *ad libitum*, when the time of trial comes—*i.e.* when the fruits are swelling off. The cultural details are the same for potted trees as for others. Figs thrive in a mild bottom-heat when grown in pots. I well remember that many years ago magnificent crops were gathered from plants elevated on inverted pans over a flue, and much the same success has followed the plunging of the pots in a mild hotbed of leaves, such as used to be common enough in vineries years ago. Bottom-heat is not a necessity of Fig culture any more than it is necessary for vines, though plenty of instances might be brought forward where both had benefited by its use. Except in the case of Pines and Melons, if bottom-heat is used at all, it should be given in a mild form, and must be very regular and steady. It is because of the difficulty of securing this regularity and steadiness that wise men, unless quite sure of their position, do not employ artificial aids of this character. All the water used for watering or syringing Fig trees when forced should have the chill taken off it to bring it up to 5° or so above the temperature of the house they are growing in.

PROPAGATION.—The usual methods of propagation are cuttings and layers; suckers may be altogether discarded as not suitable, having a tendency to make soft shoots. New varieties are raised from seeds, and some day something more will be done in the direction of raising new varieties from seed. The Fig is not often grafted, but it is a very useful plan to adopt in the case of seedlings, as it expedites their fruiting. If a shoot of a seedling Fig be grafted on a branch of the White Nerii or Brown Turkey, fruit may be obtained the same season. In-arching, or grafting by approach, is the best method, and it is one anybody with a sharp knife can perform. Bring the two shoots together, cut a slice off each, fit and bind them together, and keep them in that position till the union is effected, when the seedling shoot should be severed from its parent, and the shoot above the graft be removed. The Fig will succeed by other modes of grafting, but the method described above may be done any time, and is certain in its result. Cuttings of ripened wood 7 or 8 inches long, preferably with a heel of old wood, will root in bottom-heat in spring, and soon make nice plants for fruiting in pots or planting out. Layers in autumn soon form roots, and may be detached at the end of twelve months.

VARIETIES.—The White Nerii is, I believe, synonymous with the White Marseilles, and is an excellent kind for early forcing, being one of the best Figs for forcing in pots. The Brown Turkey is a good companion for it, coming in a little later. The black Fig, Negro Largo, is a good one, and if more varieties are wanted add the Black Marseilles and black, white, and brown Ischias, which are all good.

CHAPTER VIII

The Apricot under Glass.—The Moor Park is the best variety for planting in a house, and they may be trained to a trellis, after the manner of Peaches. I do not recommend the use of galvanised wire for the trellises, for there is a degree of uncertainty about its action which would prevent my using it for training choice fruits, or especially one so liable to gum as the Apricot. The Apricot-house may be from 18 to 20 feet wide. If a lean-to, the front trellis may stop 3 feet from the back wall, and should be circular in outline, so as to let as much light as possible fall upon the back wall. In a span-roofed house trees will be planted on each side, 14 feet apart. The border should be partly inside and partly out, and be composed of good loam, without manure, as the necessary support can be given when the trees bear freely. The border need not be more than 10 feet wide, for it is more economical to lift the roots and remake the border when the trees need such assistance than to make the border too large at first. Two feet will be deep enough, and the drainage must be perfect. If the trees are planted in sound loam without manure there will be no gross or plethoric wood. Very little, if any, shortening will be required, and the less pruning the better, for I am persuaded that a great many of the ills from which Apricots suffer are due to errors of pruning. If the disbudding and the summer pruning are rightly understood and properly carried out, very little pruning should be necessary in winter, and that little should be left till the blossom buds are getting prominent, for they indicate the part where the knife can be introduced. The autumn, as soon as the leaves fall, is the best time to plant, and I should recommend maiden trees only to be employed (I may say, to satisfy the uninitiated, that a maiden tree is a tree which has had only one season's growth from the bud, and has not been cut back). In dealing with young trees, instead of permitting the shoots of the graft or bud to rush away, as is commonly done, it would be better to pinch the leaders when 15 to 18 inches of wood

had been made, to strengthen the base and render cutting back unnecessary. In their early stages the treatment accorded to Peaches will suit Apricots, the only difference being that Apricots are more impatient under artificial heat. But when rightly managed, especially as regards ventilation, Apricots under glass bear immense crops of fruit, and will pay better for glass coverings than many things which are more favoured. The fruit grown under glass is of superior quality, and easily protected from the attacks of wasps and flies. It often happens that Apricots in the open air are many of them quite spoiled by wasps or earwigs; but in a house we have only to cover the ventilators with hexagon netting to keep them quite safe. I do not recommend their culture under glass exclusively, as there will always be warm sites planted with Apricots in the open air; but I know, taking an average of ten years, that a moderately-sized house, planted with Apricot trees, will produce as many fruits as a good length of wall. This is a question more for owners of gardens than gardeners; but I cannot imagine any gardener who would not be glad of an Apricot-house if he had any choice in the matter.

VARIETIES.—I have already said that the Moor Park is the best variety for culture under glass, but several varieties having the Moor Park origin may be planted with it to lengthen out the season. Of these Powell's Late, D'Alsace, and Beauge are the best. I should also add the Peach Apricot to the above short list.

The Plum-House.—Of late years Plums in the open air have been an exceedingly uncertain crop, and this fact may induce many having means to adopt their culture under glass. A somewhat similar structure to the Apricot-house will suit them admirably, and the same steady regular treatment which has been recommended for Apricots will suit Plums. A span-roofed house is the best, but a lean-to should not be despised, for it is mainly a question of light and ventilation, and any structure which supplies these essentials will do. In the general management of both the Apricot and Plum it is a good plan to lay in as much young wood as space will admit without overcrowding. Though the Plum does not force well, it will bear more heat than the Apricot, but by planting early and late sorts together a long succession may be had without forcing. I have already referred to the culture of Plums in pots in the Orchard-house, and I am alluding now only to planting them in the borders of the house, and their training on trellises; and so manageable are they in this respect that the trellis may assume any shape. They dislike cold currents of air blowing through them when in blossom or when the growth is young in spring, but ventilation close to the ground line will be

very beneficial. The choicer dessert Plums only should be planted under glass, as these kinds oftener fail in the open air. I need not take up space by details of management, as routine work is the same both indoors and out. Insects must be kept down by fumigation and timely attention to the wants of the trees. Care must be taken not to bring on exhaustion by over-cropping, for generally under glass the fruits set freely, and there is a great temptation to over-crop; this, in fact, constitutes a real danger. The disbudding of the young wood should be done early, as in the case of the Peach, though, as the crop is borne on spurs, the disbudding of Plums will be merely thinning the shoots where too much crowded. The pinching of the young shoots will begin when four leaves have been made, taking the shoots in rotation as they arrive at the right stage. Though this necessitates watchfulness and care for a longer period, it involves less check to the trees. Pinch all laterals to one leaf. The fruit should be thinned rather severely if fine Plums are wished for, and as soon as the crop is thinned mulch the border with old Mushroom manure or something similar. The syringe must be used freely every fine day, and during the growing season the border must be kept in a moist condition; but discontinue both atmospheric and root watering as soon as the Plums show signs of ripening, throwing open all ventilators to their full extent. The

PRUNING, TRAINING, AND CLEANING should be done as soon as possible after the leaves fall, but the borders must not be allowed to get dust-dry, not even in winter. In winter, it is important that the condition of the borders in all fruit-houses should be thoroughly examined, and all dry spots completely moistened before work begins in spring, as neglect frequently leads to fruit dropping.

VARIETIES.—Green Gage, Transparent Gage, July Green Gage, Purple Gage, Guthrie's Late Green, Golden Drop, Denniston's Superb, Jefferson, Kirke's, Reine Claude de Bavy, and Washington.

The Cherry-House.—When the young wood of the Cherry has been well ripened, which it always is under glass, a crop of fruit may be relied on, under fairly good management. The Cherry forces well if the temperature be kept regular and steady, avoiding extremes of heat. The border where the trees are planted out should be composed of turfy loam, inclined to be sandy rather than heavy. Autumn planting is best, as it allows the trees time to get their roots to work before spring, with its excitement of light and warmth. Any kind of house will do for Cherries, but except for early forcing a span-roofed house is best, with a circular trellis spanning a central path, planting the trees on each side

from 14 to 18 feet apart. The branches of the Cherry are so flexible when young that they may be trained in any way the cultivator desires. The fan shape answers well, and is understood by everybody. In the estimation of some the horizontal has advantages, but the Palmetta is at least equal to the horizontal. No manure should be used in the construction of the border if the loam is of good quality. Rich top-dressing and liquid manure, when the trees need support, are far better than planting in a rich soil, as the former plan enables the cultivator to keep his trees well in hand and under perfect control. The May Duke is the best forcing Cherry, but others should be planted to give a succession. I have already pointed out the advantages of maiden trees, and in such a border as I have described the trees may have full swing, giving encouragement to the weakly parts of the tree in summer by pinching a strong shoot, if needful, but doing little knife pruning. When tying-in young shoots in summer be careful to allow room enough for the wood to grow, as the Cherry progresses rapidly under favourable conditions, and much mischief may be done by a tight ligature. If the young trees are well selected, healthy, and strong, very little heading back will be needed, only removing the soft unripened points. Nothing is gained by overcrowding the branches. From 7 to 9 inches is a good distance to train such kinds as the May Duke. After the trees fill the trellis and fairly settle down to work, they will go on for years bearing full crops and making but little wood. With trees in this condition it is not advisable to begin pinching too early—though all superfluous growth should be removed before the fruit begins to ripen. In forcing the Cherry or the Plum the start must be very steady, commencing about the first or second week in February with a night temperature of 40° , allowing 10° rise in the daytime, or more if the sun shines. In the course of three or four weeks the night temperature may advance to 45° , and it should not much exceed this till the blossoms are set, when a further increase to 50° may then take place. If at any time a little extra fire is accidentally put on, or if, from a change of wind or any other circumstance, the temperature should rise above 55° at the utmost during the stoning period, ventilation should be resorted to immediately, as one night of such neglect may cause the failure of the crop; therefore constant watchfulness is needed, but those who exercise this care find no difficulty.

THE VENTILATION is, in fact, the most important point in Cherry culture. A close stuffy atmosphere is death to the blossoms and the young fruit. After the fruits are stoned they will bear pushing, but not sooner. At all times, night and day, unless

during cold, windy, or frosty weather, the Cherry-house should never be altogether closed, or without the means of obtaining a circulation, which can and should be procured without creating a draught. An opening or two along the ground line, where the fresh air will pass through or over the hot-water pipes, can easily be arranged without detriment to anything. The application of moisture, both over the branches with the syringe or engine, and also at the roots, is a necessity of all culture under glass, and the chill should be taken off all water used in forcing-houses. Water used for syringing must be soft and free from impurities.

INSECTS.—As soon as the blossoms and green leaves appear, the green fly will probably appear also, and must be dealt with by fumigation. The black aphid comes later on, and is more difficult to destroy; but dusting with Tobacco powder, and one or two fumigations, usually clear them off. If the red spider appears in large numbers, it may be taken for granted that some mistake has been made in the interior of the house, generally by keeping the borders and the atmosphere too dry, with, perhaps, deficient ventilation. Strong robust foliage, such as is growing on trees well cared for, is not often attacked; or if it is, the syringe soon makes short work of the spiders.

CHERRIES IN POTS may be grown where no special house is set apart for them, and they force readily enough when not hurried. They will do in the Orchard-house, or in any house where there is plenty of light, with a low temperature and proper atmospheric condition. A firm root-run is essential to all stone fruits, and very often when difficulties appear about the stoning time, they may arise from a deficiency of lime in the soil, unless some other more likely cause be present. Stone cracking and the casting of the crop prematurely are generally produced by a deficiency of lime.

VARIETIES.—May Duke is the best for forcing. Early Purple Gean, Belle de Orléans, Governor Wood, Werder's Early Black, Archduke, Royal Duke, and Late Duke.

CHAPTER IX

The Pine Apple.—Though Pine growing in this country is for the present languishing in face of foreign competition, yet, as history repeats itself, something may occur to bring the king of fruits into such repute as to make its re-cultivation at home remunerative. I shall not enter minutely into this matter, but only state what I consider to be the chief essentials.

HOUSES FOR PINES.—For convenience sake, I divide the life of the Pine Apple plant into three periods—viz. First, the sucker or propagating stage ; second, the successional period ; and thirdly, the fruiting time. Under fairly favourable conditions these three periods or stages will occupy about 20 months or two years. Thus from the time the sucker is taken from the old plant till the fruit ripens will be about, say, two years, roughly computed. As during these three stages of growth somewhat different treatment will be required, so, if possible, there should be three different structures to ensure a fair succession of fruits. The fruiting-house should be capable of holding 100 plants, allowing from 2 to 2½ feet square for each plant. The succession-house need not be quite so large, as the plants in this stage will not take up so much room ; and the sucker or propagating house may be still smaller. A span-roofed house is best for successions and fruiters, as light is essential to dwarf sturdy growth, and the latter condition is necessary to produce handsome well-swelled-off fruit. In the old days I remember so well, Pine-houses were always lean-to's, and the roofs of most were heavily timbered. The beds or pits for bottom-heat were composed of tan or leaves, and a flue supplied the top-heat. Though this, in comparison with present appliances, may be considered rather primitive, yet very good Pine Apples were cut under such conditions. The fruiting-house should have hot-water pipes for both bottom and top heat, though they are not absolutely necessary for the successions and suckers, provided plenty of tan or leaves can be obtained for bottom-heat. Still, pipes are best, and as they are necessary for top-heat, the extra cost of running a couple of pipes under the bed may well be incurred. In all stages the plants should be near the glass, though in hot weather its proximity will render shading more necessary. Still, with all this, to obtain fine fruit in the shortest time possible the plants must be near the glass. A very good house for Pines is a half-span, with a long side facing south, and a short light to the north. It very often happens that Pine stoves have to do double duty. I have seen Cucumbers, Grapes, French Beans, Tomatoes, and Strawberries coming on vigorously in a Pine stove, and all gardeners know the value of such structures in forwarding many things early in the year. In the management of the Pinery the plants cannot be potted and shifted on as required, in the same way as a collection of stove or greenhouse plants. For reasons which need not be explained here, the potting and shifting usually take place either in March, midsummer, or September. These are the three periods when the potting, top-dressing, and general rearrangement take place in large Pine-growing establishments ; and usually all hands

are put to the work to execute it with despatch. While one party are potting the Pines another party can be changing or renewing the plunging material. Even where there are hot-water pipes this will be necessary sometimes. Oak leaves are excellent to plunge the pots in: where they cannot be had Cocoa-fibre will do. Tan is often used, but careful managment is required to keep it from getting too hot. The best way is to mix the fresh and the spent tan together, about one part of the former to two of the latter; this will be quite enough where bottom-heat from hot water is laid on. If there is any danger of the tan getting too hot, the bottom-heat from the pipes should be shut off. With leaves or Cocoa-fibre there is no danger of over-heating. The late Mr. Andrew Knight, of Downton Castle, thought Pine Apples might be grown without bottom-heat; he tried to grow them on stages like other stove plants, but did not succeed. Not only is the bottom-heat essential, but the plants seem to like their roots enclosed in a bed of moist fermenting matter. It adds to their strength and vigour. The bottom-heat need not exceed 75° or 80° in a general way. There are times when shy or sluggish fruiters may, with advantage, have a little more to push up their fruits or to finish them off, but during the early stages of growth 75° will be enough.

PROPAGATION.—This is from suckers and crowns, the former method being the one chiefly relied on where a sufficient stock is kept up. As Pines are not, in private families, required all at once, neither should the suckers be all potted at once. The best plan is to plant a proportion of suckers at each potting season—*i.e.* some in spring, others at midsummer, and some in September. Where suckers are plentiful only the strongest and best should be potted. By having the power of selection the probationary period may be shortened, as the weaklings will be thrown away. Some people use rather a lighter compost for the suckers, but where they are strong this is not necessary. Turfy loam from an old pasture that has lain in a heap from eight to ten months, broken up with the spade, with half a gallon of soot and the same quantity of bone meal to each barrowful, will make a good compost. Any further support can be given in the shape of liquid manure. The short leaves at the bottom of the suckers should be trimmed off and about half an inch of the base removed with a sharp knife. The size of the pots must be regulated by the size of the suckers, but 6-inch pots will do for the strongest. The pots must be well drained, for water-logged plants never do any good; and the soil must be pressed in firmly, as they root more speedily and vigorously in a firmly-packed soil than when loosely potted. When the

potting is finished plunge them in the prepared bed in the sucker-house or pit, keeping close and shading from bright sunshine, lightly dewing them over with the syringe every fine day to maintain a moist atmosphere. Very little water will be required in the pots till roots begin to form. After the first watering, which may be given a day or two after potting, little more will be required till the roots strike out. Sometimes suckers are planted thickly in a bed in prepared compost or in a warm pit to facilitate rooting, and then potted as soon as roots are formed; but there is not much gained by that, as when once established in pots no further check need be given. They will simply be shifted from the sucker pots to the successions, and in due time will reach the fruiting size, which, for Queen's, need not exceed 10 inches in diameter. The strongest of the suckers potted in March will in September be moved to the succession-house, and be shifted into 8-inch pots. The March following, at the latest, all will be in their fruiting pots, the strongest plants having been weeded out and potted into 10-inch pots in September. When shifting plants from a small pot to a larger one, remove two or three leaves from the bottom and drop the ball a little deeper in the new pot. By earthing up the stem in this way a new set of roots is produced, and the more strong new roots the plants have the better. In all cases perfect drainage is very necessary, and the soil should be rammed in firmly with a potting stick. If the roots are healthy the balls need no reduction. It sometimes happens that from some cause or other the plants have lost their roots. Too much water, in association with imperfect drainage, will cause this; so will a check arising from deficient bottom-heat. Too much of that heat is also hurtful. Checks and chills of all kinds must be avoided, but with careful management and proper places to grow them in there is no difficulty in Pine culture.

When a plant loses its roots from any cause, it is best to trim them all off, and the bottom part of the root stem also. Strip off the bottom leaves, and start the plant again as a sucker in a smaller pot.

SUCCESSIONAL PLANTS.—With these the chief thing is to encourage robust growth, and every cultural detail should be adjusted so as to promote that object. The proper regulation of the heat, moisture, and ventilation—the prime factors in the work—is of great importance, and some experience is necessary before these can be so adjusted as to work together harmoniously. Then again light and shade—the light of the sun, and the shade with which the burning power of the rays are extracted—*must be considered*, so as to balance them and derive the greatest benefit from

their combination. Light is essential to sturdy growth and fine fruits; therefore the plants should be near the glass. But on bright days—when the sun's power is great—a thin shade should, about half-past ten or eleven o'clock, be spread over that side of the house on which the sun is shining, and about three o'clock in the afternoon the shade should be taken off.

WATERING, both with syringe and watering-pot, requires some judgment. On bright days the syringe may be used freely every afternoon at closing time, which in hot weather in summer will be about half-past three or four o'clock. Plants having fruit blossoming or ripening should not be syringed. The walls and surface of the beds, and the house paths, may be damped once or twice a day in fine weather, or whenever the atmosphere of the house becomes too dry. Nothing but the purest rain-water must be used for syringing, as the foliage of Pines is very difficult to clean if it once gets dirty. The watering of the roots of the plants must be done with great care and judgment. If too much or too little is given they will soon become unhealthy and lose colour, and when this happens it is difficult to get them into good condition again. If they assume the tint called "foxy," they take a long time to put on the green colour which good cultivators so much wish to see, and pride themselves upon. Young growing stock and fast growing successions will in summer probably require looking over twice a week. Every plant may not want water, but each one must be examined. Weak liquid manure should be given at every watering, and the water may as a rule be poured close to the base of the plant, some of it falling just within the axils of the bottom leaves. In the winter the plants will not require so much water—once a week will generally suffice. The water should be warmed to 80°. Special circumstances in connection with each place may necessitate some modification of the rules here sketched out, but no hard and fast line can or should be laid down. In order to keep up a succession of fruiting plants some of the strongest successions will be potted into their fruiting pots at each general shifting in March, again at midsummer and about Michaelmas, and a similar, or perhaps a slightly increased number of suckers potted. By this means a constant succession will be kept up. In the fruiting-house the earliest fruiting plants will be at the warmest end, then will follow those that are later and those in flower, and lastly those just introduced. The same may be observed in the succession, for when plants are grouped in this way they are more manageable. For instance, it may occasionally happen that a certain number of the last-introduced stock may require a check to induce them to fruit. This is commonly done by with-

holding water, at the same time lifting the plants out of the tan and ventilating freely—by, in short, giving a check. A short course of this treatment will generally cause the fruit to start.

In the treatment of the plants which have missed fruiting at the proper period, a more drastic remedy is sometimes adopted. It may occasionally happen, when too much moisture has been used—accompanied, perhaps, by strong heat and deficient ventilation—that the plants run too much to growth, and so become what are termed in gardener's phraseology "stags." These are generally unprofitable, as undue growth is often but "great cry and little wool." But to do something with them, and so avoid a total loss, it is best to cut them off level with the top of the pot, or only just a little beneath it. Trim off the bottom leaves, pot firmly in rough soil, and plunge in a brisk bottom-heat. The majority of plants so treated will soon push up fruits—not very large ones, perhaps; but still it is better to get a fruit of some kind off such plants, and allow them to exhaust their powers before being consigned to the rubbish heap.

MANAGEMENT OF FRUITING PLANTS.—As soon as the fruits are shown, and pass into the flowering stage, the fruit stem will need some means of support. If the fruit is a large one place a strong stake on each side, and secure it about midway between them. If small false suckers, commonly designated "gills," start up around the base of the fruit, they should be destroyed, for they only weaken it. If ground suckers appear, they also should be destroyed. Most Pine-growers have a long-handled tool with an iron blade, fashioned like a spear, which is thrust into the heart of the gill or sucker and twisted round; this thoroughly destroys the gill by stopping its growth.

PLANTING OUT.—As a rule, the plants are more under control when in pots than if planted out. Occasionally remarkable success follows the adoption of the planting-out system. But I think it is better to keep plants in pots till they are fit for the fruiting-pit; then, if a nice genial bed is made, which is not likely to get too hot, they should be planted in it $2\frac{1}{2}$ feet apart each way, pressing the soil firmly round them. The same routine of syringing and watering should be followed as if the plants had continued in pots, though when planted out less water will be needed. In this planting-out system, commonly called the Hamiltonian, the plants are not pulled up when the fruits are cut; but the suckers which start up from the base are thinned out to two or three, which are then earthed up, and in the course of time all these suckers will bear fruits often of good size and fine quality. There are situations where I think Pine growing might still be made to pay—for

instance, where an abundance of fermenting material can be had to economise fuel. I have known good Pines grown without much fire-heat, but it involved a good deal of labour in renewing linings, etc., and the place always had the appearance of an immense manure heap. Still, the combination of leaves and manure worked well, and was economical. There is no doubt that, with a set of low light span-roofed pits, built on arches to give free play to the linings, and an abundance of fermenting materials always in condition for use, Pines might be grown very cheaply. The control over such structures is quite as perfect as when they are heated with hot water. Say, for instance, we have in October a house of plants large enough to fruit, and we wish to fruit them next summer: for the next three months we ventilate freely, give just enough water to keep the colour in the leaves, and let the bottom-heat sink to 70° , the atmospheric to 60° . About January, when the days are lengthening, the linings should be renewed, raising the bottom-heat to 80° ,—at the same time increasing the atmospheric warmth and moisture, and giving more water at the roots. This combination of causes rarely fails to start the fruits. When the plants are grown in pots, after fresh potting a little extra bottom-heat should be given to stimulate root-action. Suckers tend to weaken the fruits; therefore only a limited number should be left on each plant—two or three will generally suffice to keep up stock. Some kinds—such as the Providence, Charlotte Rothschild, and Smooth Cayenne—do not produce many suckers. Plants showing fruit should be watered very liberally,—giving liquid manure until the fruits begin to put on the golden tint, when the watering must be discontinued. The fruits should be cut before they are quite ripe, to get the full flavour, leaving them in the heart of the plant, but severed from it, for a day or two. I have kept Pines on the plants in a cool dry room for several weeks when they were ripe, and they may be kept by placing the bottom of the stems in bottles of water, though some sacrifice of flavour might result. Plenty of air must be given when ripening, to produce flavour, and also to ripen the suckers, preparatory to their removal. All Pine stoves heated by hot water should have troughs fixed on the pipes, which must be kept full of liquid manure during the time the fruit is growing, but not when ripening. Sometimes very handsome fruits are disfigured by having crowns out of all proportion. This generally arises from too much moisture in the atmosphere, often caused by plying the syringe too freely on the crowns.

INSECTS.—The Pine Apple plant, like many others, has its species of Cocci or scale. The white scale is the most troublesome and difficult to deal with. If the plants get badly infested it is

most economical to clear them out and start afresh with clean plunging materials and fresh plants. To make a wash, dissolve 6 oz. of soft soap, or the same quantity of Gishurst compound per gallon of water, adding a wineglassful of paraffin oil to each gallon of liquid. If the plants are very bad, they might be shaken out of their pots and dipped in the mixture, sufficient having been made for that purpose in a tub. After dipping, lay them on their sides to drain and dry. In some cases, perhaps, a second dipping may be necessary. Afterwards the plants may have a few of their bottom leaves removed, their base trimmed with a sharp knife, and then be repotted in clean pots and new soil. When the plants are not badly infested a careful sponging over may suffice. If the mealy bug gets among them it will give much trouble, but it will yield to persistent washing in the above mixture. The presence of either of these insects in a collection is evidence of bad culture and weakly plants.

TEMPERATURES.—From October to Christmas a night temperature of 60° , dropping down to 55° in the mornings in cold weather, will be safe—day temperatures to be 10° higher without sunshine. Fruiting-houses should be from 5° to 10° warmer, with a bottom-heat of 75° to 80° . With the longer days and rising temperature of spring, both night and day temperatures may be increased 5° . In summer a good deal can be done with sun-heat, as on bright afternoons after syringing the thermometer may rise to 90° or 100° with benefit.

VARIETIES.—The Queen is the best Pine for summer. There are several varieties; but for a small collection the common variety and the Moscow Queen will be enough. For winter the Black Jamaica and Smooth Cayenne are the best. Charlotte Rothschilds may be added.

CHAPTER X

The Melon.—A low span-roofed house or pit, partly sunk in the ground, without any side glass, with ventilators low down, near the ground, so that the external air may come in contact with the warm pipes on entrance, is suitable for the cultivation of this fruit. The ridge piece or cap should lift up with a lever for the egress of the vitiated air. There should be a 4-foot path down the centre, with a 3-foot bed on each side to plant the Melons in. If the house is 12 feet wide, it will require two 4-inch pipes all round for top-heat, and two for bottom-heat in each pit, to be laid in loose rubble, with a drain-pipe let in at intervals, for the purpose of

pouring in water to moisten the bottom-heat, otherwise it might get too dry to be genial. For very early Melons it might be desirable to increase the number of pipes for top-heat, to avoid the necessity for hard firing, which, in the case of a plant so subject to red-spider as the Melon, might predispose them to attack. Over the rubble should be placed as much fermented dung, or leaves, or a mixture of the two, as will fill the pit up to the top, for the nearer Melons are trained to the glass, provided the leaves do not touch, the better.

SOIL.—As regards soil, Melons do not require any complicated mixture. Turfy loam that has been laid up in the heaps six or eight months is quite sufficient, and except the first barrow-load, which is placed in each hill—about 4 feet apart—to plant in, it may be used quite rough. Good Melons have been grown trained in a makeshift manner on pliable Ash or Hazel rods, bent over from each side, and tied together in the centre; but the expense of having the house properly fitted up with wires is not great, and it will look neater and be better.

RAISING THE PLANTS.—Melons seed so freely that few people ever think of striking cuttings, though the young shoots strike freely in a warm pit, and sometimes it may be desirable to increase the stock of a new or favourite kind in that way; but the majority of the plants are raised from seeds. Where Melons are required early the first lot of seed should be sown early in February, in a warm house or pit, having a temperature of not less than 65° at night; and at this early season it is best to sow in single pots, one seed in the centre of each, sowing more seeds than we require plants, in order to have a power of selection. If six plants are required at least a dozen seeds should be sown. Sow in light sandy compost, and, if possible, plunge the pots till the seeds germinate in a bottom-heat of 75° or 80° . In all stages of its existence the Melon should be grown in a strong light, for only thus can strong healthy foliage be built up. Once begin to weaken the growth of the plants, by shading or by permitting the plants to remain any distance from the glass, and we predispose them to the attack of the red spider, which will probably appear on the scene by and by. When the plants have attained to the rough-leaf stage they may be shifted into 48-sized pots, still keeping them near the glass; and when the roots are fairly into the new soil, if the house is ready, plant them out. Nothing is gained by thick planting. Plant 4 feet apart, and lead out a shoot from the bottom of each plant, besides the main stem, and train up midway between that and its next neighbour. The leaders should be taken up without stopping till the allotted space is covered, and then the terminal

bud removed. All side shoots should be stopped one leaf beyond the fruit, and all laterals pinched to one leaf.

SETTING THE FRUIT.—It is difficult to say what should constitute a crop of Melons, for everything depends upon the size of the kind grown and the strength and development of the plant; but generally about four full-sized fruits may be considered as many as a vigorous plant should carry, and the matter should be so timed as to set the crop as near altogether as possible. The reason for this is, that if one fruit gets the lead of the others it robs them of their fair share of nutriment, and they will not grow. If we want, say, four fruits to grow to maturity, it is as well, in order to secure that power of selection already mentioned, to set at least six or eight, and, when we see which are likely to turn out best, retain those and cut away the others. I do not think it is necessary to say much about the operation of setting. Every one knows that male and female flowers, though borne on the same plant, are quite independent of each other, and unless they are brought together by some agency, fertilisation could not take place. There are various ways of doing this; but the gardener usually does it in his own rough-and-ready way by plucking a male flower from the same plant that carries the fruit he intends to fertilise. By a rapid motion of his thumb and finger the corolla is torn away, leaving the cluster of stamens exposed and uncovered. These he thrusts into the centre of the female flower, leaving it there. Both flowers must be in the right condition when the operation is performed, and the pollen must be dry. About eleven or twelve o'clock on a sunny day is the best time. After the crop is set and fairly swelling all male flowers and fruits not required should be removed, and no lateral be permitted to interfere with the direct light falling on the main leaves, for if these are injured the fruits cannot be so good as they should be. The first leaves of a Melon plant are, like the first leaves of the Grape vine, indispensable to the well-being of the crop.

EARTHING-UP.—A single barrowful of soil will be sufficient to start the young plants in, but as growth proceeds more soil will be required, and enough should be added to complete the ridge along the front of the pits. The soil should be pressed down firmly, and the plant-growth will be firmer and the foliage texture more substantial if the loam is heavy rather than light. Later on, when the fruits are swelling, the side of the bed next the path may be filled up with soil to complete the earthing-up. In light soil Melons make too much growth, and it is of too soft a nature to withstand bright sunshine and the attacks of red-spider.

HEAT, MOISTURE, AND SHADE.—Melons ought never to be shaded. When well grown in the right kinds of soil they are quite capable of bearing all the sunshine we obtain, and shade weakens the plants. With proper ventilation, and due attention to watering, shade will never be required. A comfortable bottom-heat is one of the chief requisites for successful Melon culture, for though Melons of good appearance can be grown without it, they do not possess the right flavour. In this respect root-warmth, beyond what is supplied by the sun in our climate, even when the protection of glass is added, seems essential to the highest pitch of excellence. When the bottom-heat is supplied by hot-water pipes, a bed of fermenting materials over them tends to steady the temperature, and makes it more genial; in fact, we have the steady moisture of the dung bed with the steady warmth of hot-water pipes. In the early stages the Melon requires liberal supplies of moisture, both at the root and in the atmosphere; but, unlike its relative the Cucumber, it must have free ventilation, to keep its foliage strong to the last. However, a free and perfect system of ventilation is always consistent with a steady warmth and freedom from draughts. In bright weather, as the days lengthen and the fruit is approaching its full size, a little air should be given early in the morning, and the fullest use made of the sunshine by closing early in the afternoon.

TEMPERATURE.—The night temperature from artificial means never need exceed from 60° to 65°. Of course in hot weather in summer it will range higher. The day temperature, with air enough on to prevent scorching, may run up to 80°, or more; indeed, the more warmth Melons get in the daytime the better, as the sunshine will consolidate any growth which is made. Early in the season, in order to check draughts, it is a good plan to cover the ventilators over with a coarse scrim or canvas; enough air percolates through to keep the interior atmosphere in gentle motion, without causing a chilled condition. This plan is useful in the cause of all early forcing; the scrim robs the fresh air of its icy coldness.

MELONS WITHOUT FIRE-HEAT.—There are an immense number of Melons grown without fire-heat—more, in fact, than with it. Gardeners of the old school always grew their Melons with the aid of manure alone, and much ingenuity was displayed by clever men in the arrangement of their pits and beds of fermenting materials, so as to ensure a steady warmth. In my young days I have seen a good many experiments made. Provided one had plenty of fermenting materials, such as tree leaves and stable manure, always ready for use to frequently renew the linings, as much success was

obtained with a two or three-light frame and an ordinary dungbed of substantial size as with a more elaborate arrangement. Very great pains were taken in the fermentation or sweetening of the dung, and the building up of the bed. Where only an ordinary hotbed can be had for Melons, February is time enough to begin. If a warm forcing-house is at work anywhere, the seeds may be sown and brought on in that; but, generally speaking, it is best to make up a small hotbed for raising plants for dungbeds. This should be done about the first week in February, and probably Cucumbers and similar things will require to be sown about that time; thus there is plenty of work for a small one-light frame to do. In hotbed-making, early in the season, the mixing and fermenting of the materials must be carefully done. If the bed is made up with rank manure, the heat will be of too fiery a nature at first, and too cold afterwards. To make up a hotbed at the beginning of February the manure and leaves should be thrown up in a heap about the middle of January, and when hot it should be turned and well shaken together, the outsides of the heap placed in the middle, and any dry spots moistened by watering. This may require repetition until the whole is in a nice sweet condition, when the bed should be made of sufficient size to accomplish the end in view. A one-light seed frame in January will require a bed 5 feet high at back and 4 feet at front. It should also be 1 foot wider and longer than the frame. Some care must be taken in building it up to give uniform pressure all over the surface, so that it may settle equally all over the bed. The site for the bed should be set out by driving in a stake at each corner; then place a layer of equal thickness all over the space enclosed by the stakes, and either tread or beat it down to the requisite degree of firmness. This is a matter of some importance and requires a little experience, for, if made too firm, it will hardly heat sufficiently to produce the requisite temperature. On the other hand, if packed together too loosely, it will heat too violently, and afterwards become cold and give endless trouble in lining. It will thus be seen that simply throwing a heap of dung together, and then placing a frame and light on the top, will not lead to success. Not only must the stuff, whatever is used, be sweetened by mixing and turning for a fortnight before using it, but the bed must be so constructed that the heat will be regular and steady. Some sawdust or Cocoa-fibre may be placed in the frame to plunge the pots in, and at night it must be well protected with warm coverings. Linings must be added to the bed when the heat declines, and this period will need watching, to arrest the decline before the temperature gets too cold. The fruiting-bed must be built up so

as to be ready for receiving the plants when in a fit condition to be put out. The culture of

MELONS IN FRAMES in its leading features is like the culture in houses heated by hot water. In each case the heat must be steady, both at the root and in the air. The same care as regards ventilation and atmospheric moisture is necessary. As regards the training of Melons in frames, the usual way is, when the bed is ready, to place a hill of loam in the centre of each light, and leave it a day or two to get warmed through to the temperature of the frame, then put it into the right position and press it down to the requisite degree of firmness, and put one good strong Melon plant in the centre of the light. Sometimes two plants are placed in each light, but, unless the lights are longer and wider than the average, I think one plant enough. The plants will probably have been stopped several days before, and the moment the roots begin to feel the stimulus of the fresh soil four or more shoots will break away from the base of the plant. Four of the best of these will be pegged out towards the four corners of the frame, but before much progress is made more earth should be placed in the frame to fill it up to the level of the hills, or nearly so. Melons succeed best in a somewhat heavy loam, made rather firm by pressure. If the soil is at all light they make too much growth, and the constant pinching and pruning which is thereby rendered necessary not only weaken and exhaust the system of the plant, but often lead to the attacks of disease and insects. That fatal disease, gangrene, is often produced primarily by planting in a soil too light, and possibly too rich. As soon as the four leading shoots reach the corners of the frame the terminal buds must be pinched out, and all the side shoots should be stopped one leaf from the fruit. Set the crop of fruit as nearly altogether as possible, and as soon as they begin to swell place them on pans to lift them off the ground. It is best to place the flower end of the fruit towards the north. Sometimes the fruit cracks, and I have an idea that the sun, when it shines early in the morning upon the fruit, may have some injurious influence, especially if the ventilators are not opened as early as they ought to be.

THE FLAVOUR OF MELONS is, more than any other fruit, influenced by culture. When the finest possible condition is reached the flavour remains in the fruit but a short time; hence the difficulty of always having a really good fruit to place on the table for any particular party unless a large number are grown. As soon as the fruit begins to change colour water must be withheld and plenty of air given. When near the ripening stage the fruit should be cut and placed in a cool fruit-room for a day or two, and then sent to table.

DISEASES AND INSECTS.—The chief disease which attacks Melons is the gangrene or ulcer. It seizes the main stems and generally causes premature death. If promptly met it may be checked by a free use of quicklime applied to the parts affected, by increasing the temperature, giving more ventilation, and watering very carefully. Avoid pouring the water in the centre of the plant, but give it more liberally round the sides of the frame. This disease is more troublesome in frames than houses. Fluctuation in the bottom-heat furnishes a condition favourable to its propagation. Cold and damp help it forward, but warmth and dryness are its enemies. It has something of a fungoid character. The chief enemy of the Melon-grower is the red spider. I suppose that Melons are more injuriously affected by this insect than by any other cause. No matter how carefully the cultural conditions may be carried out, sooner or later he makes his appearance. If he cannot get a footing beforehand in house or frame, he will at least be in at the death. The best antidotes are a vigorous growth in the full light of the sun, a genial condition as regards moisture at the root and in the atmosphere, with a smell of sulphur about the house or frame at all times. Regarding varieties, little need be said, as Melons are good or bad mainly because of the surrounding conditions of culture.

CHAPTER XI

Forcing the Strawberry.—Immense numbers of Strawberries are forced annually in pots, and for early work there is no better way of forcing them. Later crops have often been well done in boxes, or planted in frames. But the forcing of the Strawberry, as now carried out by the best cultivators, with single plants in 6-inch pots, is the best and most advanced practice.

SELECTING THE PLANTS.—Once I was gravely asked if the first plant on a Strawberry runner did not generally come blind. This, of course, is a fallacy. If the parents are fertile, the progeny will be so, subject to a constant tendency which all cultivated plants have (especially Strawberries) to return to their original condition, if the means by which they have been lifted up in the scale are withdrawn. It is specially important that all plants intended for forcing should be propagated from advanced types only, and for this end it is a good plan to select some of the best and most fertile of the plants forced. Mark them in the forcing-house, and as they come out, place them on one side till all are collected, and then plant in an open situation, 3 feet apart each way. If all runners

are picked off the first autumn, and all flowers the next spring, some very strong early runners will be produced, which may be secured in advance of other methods. Early growth leads to early maturity, and early rest is the natural precursor to early awaking. This is the condition the forcing gardener desires, as it not only saves fuel but leads to better results. There is more than one way of treating the early runners. They may be layered into small pots, and, when the plants are established, severed from their parents. In the course of two or three weeks they should be placed in their fruiting pots, which will be for the most part 6 inches in diameter, or what are commonly known as 32's. Pots a size smaller are sometimes employed, but 6-inch pots are the best, and give less trouble.

SOIL AND POTTING.—Next in importance to the selection of the runner is the question of soil and the potting of the plants. A rather heavy loam should form the main staple, with something added to enrich it. A very easy way of doing this is to place the loam and the manure in alternate layers when the loam is first carted home. A compost of horse-droppings fresh from the stable, from which all litter has been shaken, about one cartload of droppings to three or four (according to quality) of loam, packed up in a ridge and left for eight or ten months, and then chopped down and broken up for use, to be thoroughly incorporated, will grow many other things well besides Strawberries. The drainage of the fruiting-pots should be carefully seen to, as the plants will need a good deal of water through the forcing time until the fruit begins to colour; but one crock to cover the hole in the bottom, and $1\frac{1}{2}$ inches in depth of small crocks over it, will be sufficient for 6-inch pots. Place a handful of rough fragments of turfy loam on the crocks. Keep the crown of the plant well up in the pot, and ram the soil firmly in. Have the ground in a proper condition, being neither wet nor dry, but in a nice friable state. When the plants are potted they should be placed in an open situation, on a bed of ashes, or on boards, or some impervious bottom, where worms cannot penetrate. All weeds must be pulled from the pots, and all runners cut from the plants. Neither should they be crowded, but every plant should have room for the proper development of its foliage. The supply of water must be ample, giving liquid manure two or three times a week till the end of September. By that time all growth should be finished, and the pots full of roots. Though frost would not hurt plump well-ripened crowns, it would certainly break the pots if they were exposed to it; and for that reason, before severe frost sets in, the plants should be plunged up to the tops in ashes or old tan, or something that will protect the pots. I have often

used leaves. Turf pits, with some old lights to keep off heavy rains, are good places to winter Strawberries in. If nothing better can be done, plunge in the open air, and when the frost comes strew some dry Fern leaves over them to shelter the pots. Frost has a resting effect upon well-matured plants, and covering should only be used to save the pots from breakage. If I were forcing Strawberries very largely, after the growth was well ripened I should turn them out of the pots, pack the balls close together on a bed of ashes, with some litter placed round the outside plants to keep them from drying, and place as many in pots again as are required for forcing.

COMMENCING TO FORCE.—It is difficult to say really when forcing begins, for the most important part of the work is done during the summer and autumn previous. If the blossoms are not packed away in the crowns of the plants, no amount of forcing, as ordinarily understood, can produce fruit. Not only must the blossoms be there, but they must possess the vigour and substance which right management only can give. There is no great demand for ripe Strawberries much before March, and to obtain them by the middle of that month, the first batch of plants should be introduced to the forcing-pit about the first week in January, and relays of plants must be introduced fortnightly to keep a succession. The blossoms will come away a little stronger if the pots can be partially plunged (just enough to steady them) in a bed of leaves where there is a mild fermentation going on, and where the plants can almost touch the glass. In this position they may remain till the flowers are just beginning to open, when they are taken to the forcing-house, which should be a very light structure having a complete system of ventilation which can be easily applied. In forcing early Strawberries now no one trusts altogether to a circulation of air to set the fruit. As the blossoms open, every day about noon a man or a boy touches each flower with a camel-hair pencil, all weakly blossoms having been previously picked off. There is no difficulty in getting Strawberries to set under this system. As regards the number of fruits which a fully-developed Strawberry plant should be permitted to carry, it is obvious that everything, or nearly everything, must depend firstly on the strength of the individual plants, and secondly, on what size we wish our Strawberries to be. It is certain that a badly-developed, perhaps imperfectly-fertilised blossom cannot grow into a large fruit, no matter how few may be left on the plant; but, as a rule, with healthy vigorous plants having all their parts perfect, if we leave only a moderate number of berries on the plant, we shall have as much fruit in bulk and weight as if the number left were doubled. Usually, if

only ten or twelve berries are left on each pot, a more valuable lot of fruit will be produced than when they exceed that number.

THE ARTIFICIAL SETTING AND THINNING of the fruit are links in the chain of success in the early forcing of the Strawberry which no one can afford to neglect. It is a good plan also, as soon as the fruit begins to swell, to support it in some way, keeping the berries from coming in contact with the liquid manure, which should be given freely as soon as they are fairly set. I usually link the clusters of fruit up to small stakes so that they stand clear of everything. In such a position they get both colour and flavour. It is specially important that the plants, after they are placed in heat, never suffer for want of water. The pots will be so full of roots that it will be almost impossible to over-water. If they get dry enough to flag, the ends of the roots, which lie round the sides of the pots, will suffer, if they do not die outright. At any rate, I have known instances where the effect of a single bad case of neglect has seriously injured the crop by checking its growth. We often hear of cases where the fruit turns hard and becomes rusty, instead of swelling off and ripening properly, and in nine cases out of ten this arises through neglect in watering. To obviate this, as the watering of Strawberries is, from necessity, sometimes left to inexperienced hands, pans are placed under the pots, which are kept full of water. This is generally done on the principle of choosing the least of two evils. We often run the risk of making the roots sick from repletion rather than incur the danger of starvation. The former danger can be guarded against by occasionally emptying the saucers and leaving them without water for a time. Another way of meeting this difficulty is to stand the pots in troughs and flood them occasionally with water. In connection with this system, it is a good plan to stand the pot on thick square sods of turf, into which the roots will penetrate. The proper watering of forced Strawberries is one of the chief essentials to success, as the Strawberry will utilise profitably, while the fruit is swelling, a good deal of support, commonly given in the shape of liquid manure. If not too strong that manure may be supplied at every watering. During the time the fruit is swelling the syringe should be used freely over the foliage, as the red spider, if permitted, will soon establish itself on the leaves.

FLAVOURING THE FRUIT.—If convenient, the plants, when approaching ripeness, may be moved to a cooler house, where more ventilation can be given. If this cannot be done the plants supporting the ripening fruit must be kept drier, the supply of liquid manure must cease, and as much air given as is consistent with the well-doing of the other occupants of the house. If the plants are

moved from one house to another to get up the flavour in a drier cooler atmosphere, that must be done carefully. The Strawberry is a soft fruit. If shaken, so that the fruits touch each other or rub against the edges of the pots, they will be sure to sustain some injury.

INSECTS AND MILDEW.—The red spider is the chief insect-enemy which Strawberry-growers dread, and the syringe is the best weapon to face it with. Strong, healthy, vigorous plants are less liable to be attacked than those with thin flimsy foliage. The green fly can easily be kept down by fumigations with Tobacco smoke, but the syringe and plenty of clean water will go a long way in keeping down aphides of all kinds. Mildew sometimes appears, especially in the case of large soft-fruited kinds; but when this happens it generally arises through too much moisture being present in some form or other during a continuance of dull sunless weather. If mildew appears on anything, the best plan will be to remove every plant with the least suspicion of whiteness upon it, and alter the conditions of the house at once. Paint the pipes with sulphur, use a little more fire, and give more air.

KEEPING PLANTS A SECOND YEAR.—Though young plants when well done undoubtedly produce the finest fruit, yet, for bulk of crop, healthy two-year-old plants are not to be despised. When the forcing is finished, a selection is made of the best and healthiest plants remaining after the stock of runners in the future has been provided for. The plants are shaken out, and repotted into clean 6-inch pots, adding a little of Amies' manure (about a pound to a bushel) of the ordinary Strawberry compost. Other stimulating artificials are probably as good or better than Amies', but it is the only one which I happen to have used for the purpose. The plants that are intended

FOR LATE FRUITING may be planted in boxes, or be turned out of the pots into beds of soil in pits or frames, where a little warmth can be given with the view of saving labour. The plan, I grant, has its disadvantages, and I know many experienced growers prefer to keep their plants in pots, as under pot culture, though a little more labour may be required, the plants are very manageable. As fast as the fruits are gathered from one pot it can be removed, and another takes its place. Each Strawberry plant has a separate and independent existence, and it is this mobility which will always keep the pot system in favour with practical men, who quickly detect the weak points in any case. In the majority of gardens where Strawberries are forced, and their name is legion, they are commonly treated as catch crops—in Peacheries, Vineries, Pineries, Cucumber and

Melon houses, and in the various plant-houses. In fact, Strawberries are grown anywhere and everywhere under glass in spring, and the pot system of culture is the only one which in all respects meets the plants' as well as the cultivator's requirements.

VARIETIES FOR FORCING.—*Vicomtesse de Thury*, *La Grosse Sucrée*, *President*, *Sir Joseph Paxton*, *James Veitch*, *British Queen*, *Loxford Hall Seedling*, *Sir Charles Napier*. The above are all good forcers, and, if carefully packed, will travel long distances without injury.

IN PACKING STRAWBERRIES for travelling very careful treatment is necessary. In the first place, properly constructed boxes will be required. Those I use are made of thoroughly seasoned wood (half-inch stuff), 12 inches square, and about $1\frac{1}{2}$ inches deep—just deep enough to hold one layer of fruit. A layer of cotton wadding is placed in the bottom, and each Strawberry is packed in a separate leaf—either a small vine, a French Bean, or a large Strawberry leaf will do. The leaves are gathered a short time before they are required, so that they may lose their stiffness before coming in contact with the fruit. The Strawberries must be placed close together, so that they cannot move; and when the box is full, a layer of leaves, followed by a layer of wadding, will complete the packing. I need not say that everything must be perfectly dry.

CHAPTER XII

Miscellaneous Fruits.—I will close these chapters on fruit forcing with a brief reference to a few fruits not generally grown, but which I have found valuable additions to the dessert. Whatever we may say or do, there is a demand for novelty in all things, and the wise man, instead of ignoring that demand, endeavours to meet and supply it.

THE BANANA (*MUSA CAVENDISHII*).—I suppose no one on tasting his first Tomato or Banana goes into ecstasies over it; but if he perseveres, the taste grows until it is possible he may desire never to be without these luxuries. The cultivation of the Banana is the easiest thing imaginable, and may be summed up in three words—"Heat and moisture." The dwarf species, *Musa Cavendishii*, is best adapted for moderately-sized establishments. They may either be planted out in a pit supplied with bottom-heat, or grown in pots, and the pots plunged in bottom-heat. In either case a good deal of top-room will be required, as the leaves are large and spreading. The house for Bananas should not be less

than from 14 to 16 feet high to the ridge, and there should be pipes enough to secure a temperature of from 65° to 70° at night in winter. The soil should be turfy loam, three parts, and old hotbed manure, one part, with some sand and crushed charcoal to make it porous. If grown in pots, they may be ranged along the centre of an ordinary stove, and the remainder of the house devoted to foliage or flowering stove plants. As soon as a plant has reached its full size, the long drooping spathe of flowers is thrust out from the centre; and as the flowers open, set, and afterwards wither, the fruit begins to swell, so that the first open flowers have set, and the fruits are swelling rapidly, before the last flowers in the cluster have expanded; in fact, it is hardly worth while to allow all the flowers to set. When a sufficient number to form a good cluster has opened and set, the remainder may be cut off. While the fruit is swelling frequent waterings with liquid manure should be given. The fruits ripen in succession, and may be gathered as they ripen by plucking them off, leaving the remainder to finish growth.

PROPAGATION is very easy and simple. As soon as the plant reaches its full development, it commences to throw out offsets or suckers from the bottom, which may be removed with roots, and potted singly, growing on in a warm house, with plenty of moisture. A strong sucker will grow into a fruiting plant, if well done, in twelve months to eighteen months.

THE GUAVA (*PSIDIUM CATTLEIANUM*).—The Guavas are ever-green shrubs of the Myrtle family. About twenty species have been introduced during the last two centuries from various parts of the world, chiefly from the West Indies and South America, though two, one black and the other yellow fruited, come from China. For the most part, the Guavas are stove shrubs, but *P. cattleianum* is one of the hardiest, and may be grown in a warm greenhouse, where the night temperature does not exceed 50° from fire-heat. If planted out in a bed of loam and peat it grows rapidly and will speedily cover a large space. When grown for its fruit alone it does best trained to wires near the glass. It flowers early in June very freely, the flowers being white, springing from short foot-stalks in the axils of the leaves. The Guava requires no more care than the Orange or Myrtle. When in flower a drier atmosphere should be maintained till the fruits are set, then the syringe should be used freely, as thrips are sometimes troublesome, being very fond of the Myrtle family. The brown scale will give trouble if it effects a lodgment. The fruit ripens from August onwards through the autumn in succession for several months, and has an agreeable taste, the flavour being unlike all other fruits.

The fruits vary in size, the largest approaching the size of a Plum, but some are much smaller, especially when the tree is bearing a heavy crop. Liquid manure may be given freely when the fruits are swelling. They may be propagated by cuttings, layers, and seeds. The species named above is the kind used in the manufacture of the Guava jelly of commerce. It is very easily cultivated, and not only is it a handsome shrub growing some 20 feet high, but its fruit furnishes a nice change for the dessert. When it ripens too fast for that purpose it may be converted into jelly.

PASSION FRUIT (*PASSIFLORA EDULIS*).—This succeeds well in a warm, light house. I have grown it in a conservatory, and though it bore freely enough, the fruit did not ripen well; the rinds were so thick that there was little room left for pulp. A stove with a night temperature of 60° to 65° in winter is the proper place to get thin-skinned fruit. The plants may occupy a large pot or tub, but they do best planted out in a border in loam and peat in equal parts. The main stem should be led up into the roof, and, when there, allowed all the freedom possible or consistent with the welfare of other plants growing beneath or near. Sometimes it is necessary to fertilise the flowers artificially, but usually in a well-ventilated house in summer the agency of insects and the currents of air effect this. It is propagated from cuttings of the young wood, when getting firm in summer, in sandy peat, and plunged in bottom-heat. When the fruits begin to put on the dark purple tint, which denotes ripening, they are ready to gather for preserving, which should be done whole in sugar. They make an excellent dish in this way, and are also very good when they hang till quite ripe. As a dessert fruit I consider *Passiflora edulis* to be superior to many things served up.

CAPE GOOSEBERRY (*PHYSALIS EDULIS*).—This is not generally grown, though its culture is easy, and it makes a nice dish occasionally. If a small house can be set apart for it, it is best planted out, and treated somewhat like the Tomato—*i.e.* trained up near the glass, and the roots confined within a small bed or pit to prevent too rampant growth. Cuttings of the young shoots root quickly at any season; and if strong plants are set out in a low span-roofed house or pit in January, a supply of fruit may be gathered all the summer and autumn. Liquid manure should be given as soon as the plants come into bearing. Turfy loam slightly enriched forms the best compost. If a house cannot be allotted to it, the plants may be shifted on into 10-inch pots and placed in a light house near the glass. As regards temperature the *Physalis* is very accommodating. It will succeed in a warm house, or, when the summer advances and the weather becomes warm and settled,

it may be planted out at the foot of a south wall. The fruit in appearance (except in colour) resembles its near relative, the winter Cherry. The style of growth, however, is different, as the latter is a dwarf plant, renewing itself from its base annually. The fruit of the winter Cherry is of a scarlet colour, but the Cape Gooseberry is a pale yellow. Cuttings produce the best plants, but it may be raised from seeds provided they are new and good. The fruits above-named are all of easy culture, and will be exceedingly useful wherever a good dessert is required.

PACKING FRUIT—*Grapes*.—The chief requisite in packing ripe, and, in fact, all kinds of fruit, is stillness—immobility. Grapes must not be shaken. If they are much rubbed it is a sure sign that they have not been packed tight enough. I prefer boxes to pack Grapes in. Market-growers sometimes use baskets, but in supplying the needs of a private family, it may be hundreds of miles away, boxes are best. They should be made in different sizes, so as just to hold the quantity we wish to send—one, two, or more dishes—though it is not well to send more than 10 or 12 pounds in one box. The depth of the boxes should be proportioned to the size of the bunches of Grapes; a box 6 to 8 inches deep will have depth enough. The box should have a sheet of cotton wadding placed in the bottom, and on this should be laid a sheet of thin cap paper. It should then be taken into the vinery, and one end tilted up a little by placing a 60-sized pot or a block of wood under. Place the Grapes in the box at the lowest end first; they will then fall naturally into the right position, and when the box is full they will travel any distance without injury. The stalks of the bunches will stand straight up, and the pressure brought to bear by the lid will tend still further to steady them. Small boxes as well as large ones can be packed in this way. The box should be labelled—"Grapes, with care; keep this side up." If Grapes are sent on any particular line frequently, a small gratuity to the guard of the train will not be thrown away. Special care in anything has to be paid for or acknowledged in some way.

Peaches are best wrapped in thin paper, each fruit separately, and then wrapped in wadding and packed tightly in sweet clean Moss, a stock of which should be gathered and stowed away in a dry place on purpose for packing. Before using the Moss place it on a clean mat on the floor and beat it well with a stick. This will remove all dirt and restore its elasticity. Boxes for Peaches and Nectarines should be about 8 inches deep to hold two layers of fruit. Place a layer of the prepared Moss in the bottom of the box first, and then a layer of Peaches, filling in the interstices be-

tween the fruits with Moss. Then place another layer of Moss and the second layer of Peaches, filling the box up with Moss, packing tightly, and fasten down the lid with four screws, cording the box so that there may be something convenient by which to move the box easily and carefully. Peaches should always be gathered for a journey two or three days before they are ripe.

Pines and Melons should simply be wrapped in paper, and packed lightly with Moss. Figs are best wrapped separately in vine leaves, and placed on a layer of wadding, being covered in with vine leaves and another layer of cotton wadding on the top, placing the fruits close together so that they fit tightly and cannot move. Plums and Cherries are best packed in green leaves, but in all cases they must not move about. I have already adverted to the packing of Strawberries, and need not refer to it further than to say that when the fruit has to be sent to a distance it is better to grow only such kinds as will travel well, for some are so soft that it is almost impossible to get them to their destination in good condition. Keen's Seedling travels well, so does British Queen and Sir Charles Napier.

PART V

THE VEGETABLE GARDEN

CHAPTER I

DURING the last thirty years much has been done to popularise and advance the culture of vegetables, and various influences and agencies are now carrying on the good work, chief among these being the cheap literature advocating horticulture, and the horticultural and cottage-garden societies which exist in almost every parish. Nothing but good can come from the impetus which has been given to vegetable culture, I might say horticulture, generally.

THE SITE of the Vegetable garden should be open to the south, but sheltered from the north and east, and if it has any inclination it should be to the southward. A sandy loam, not too light, is the best for gardens generally, for when cultivated and manured such a soil will grow anything. I am aware, of course, that there are hundreds of gardens where no choice exists, and the best has to be made of an inferior site. There is no land so good that it cannot be made better, and none so bad that it may not be improved by steady persistent effort. I knew a kitchen garden in the Midlands which was, some twenty-five years ago, taken from the middle of a piece of heavy clay land, and though better land could be had in the neighbourhood on the same estate, the site could not be changed; but, nothing daunted, the gardener set to work to adopt every expedient which his experience could suggest in the way of improvement. The garden was a large one, and for years the work of regeneration went on—trenching and burning, with the addition of anything and everything which would decay and enrich or lighten the cold heavy mass. I need not say that draining 4 feet deep, the drains 18 feet apart, was the first thing to be done. The set of drains when not carrying out water

were circulating air, the tendency of which would be beneficial, though its effect might not be visible externally. I have no doubt in my own mind that there is a great future for vegetable culture. The time is coming when vegetables will play a more important part in feeding the people. With a growing intelligence in the masses the effect of vegetables and fruit upon health will be better understood. When this period arrives, if not sooner, vegetable and fruit gardens will be separated, to the manifest advantage of both. In the majority of situations the deep rooting of fruit trees is a thing to be discouraged; but the average cultivator, who mixes his fruit and vegetables together, if he digs his land at all, must drive down the roots of the fruit trees. It would be more profitable to keep the fruits and vegetables separate. There are the bush fruits to form a bottom-growth if tall trees are planted. Besides, to the thinking man who knows something of vegetable physiology and the value of good leaves and roots, and how the two work together harmoniously when not crossed by the disarranging efforts of man, there must crop up in his mind this thought—"How excessively absurd it is to plant vegetables, which delight in an open sunny situation, beneath the shade of trees, and at the same time destroy the best roots of the trees—those roots upon which continued fertility depends—by the frequent disturbance of the soil." The average Englishman delights in a compromise, but there is no necessity for such a compromise as this; neither has it any value, except for those whose aspirations do not soar above a very commonplace mediocrity. The Vegetable garden, then, if we were making a new one, should be in an open situation, and no fruit trees should be planted in the vegetable quarters. I should prefer to work the fruits and vegetables as distinct features, and if I yielded to compromise at all it should be only so far as to permit a border for dwarf trees or pyramids on each side of the central walk. There might be double rows on each side, but even then the fruit trees should be near enough to each other to occupy all the ground as they grow up, so that no digging with the spade would be required amongst them to drive down the roots. On deep warm soils deep-rooting does less injury, but even then roots working away from the influence of the sunshine are not of much value.

Assuming, then, that we have a piece of land in an open field which we wish to make into a vegetable garden. In the first place, Does it require draining? If so, it should be drained at once, and efficiently. The question may—has, in fact, often been asked, How shall we know when land wants draining? The experienced man can often tell by the wild plants growing

upon it. If they belong to a section fond of moisture, and if in addition to this we sink a hole 3 feet deep, and at any time during the winter half-year water stands in a stagnant condition at the bottom of the hole, the land requires draining, and less than $3\frac{1}{2}$ feet deep will be of no use. The distances the drains are to be apart will depend upon the nature of the soil, but no hard or fast line must be laid down. If the vegetable garden is taken from the field, the boundary fence will require some consideration. I suppose no one would build a wall for a mere vegetable garden, as a good hedge is warmer, and if well managed will soon form a good protection.

HOLLIES AND THORNS.—The former makes a hedge which, if well managed, will be a joy for ever. Plant on a raised mound, in a single row, bushy plants, as nearly as possible of one strength, from 12 to 15 inches apart. I have said plant on mounds, but the ground on the sides of the hedges should form a sloping border for early vegetables—at least on all aspects but the north, and even there depth of soil will be an advantage in hot summers. The greater the slope given to these borders the better it will be. If soil has to be taken from other parts of the garden to make these raised borders, even then the advantage secured will outweigh the trouble incurred. Next to the Holly as a hedge plant is the White Thorn, and, indeed, the Thorn forms a good hedge in less time than the Holly, for the latter is notoriously a slow plant in starting. Once get it well established in a suitable position, and it goes ahead rapidly, but at first it is a slow grower. Deepening the soil in the way I have suggested will cause the Holly, or any other plant which may be used to form a boundary fence, to grow with more vigour. If the Holly hedge be planted on the crown of a ridge 2 feet high, the shelter to the garden will soon be appreciated, especially as regards the early crops growing on the southern slopes. These slopes or borders should not be less than 12 feet wide, and their value in the production of all early crops will be immense.

WALKS AND EDGINGS.—If the question of vegetable culture be looked at simply from a utilitarian point of view, expensively-constructed walks or edgings are unnecessary, and in point of fact I would rather leave the walks an open question to be settled each one for himself. If permanent edgings must be used, I should prefer dead edgings to living ones, as the latter often harbour slugs, etc., and are expensive to keep in good condition. In the case of all large vegetable gardens a road wide enough for a cart should be made down the centre for the purpose of carting on manure, etc., and this road should be gravelled and kept in good

repair. The other paths may be strips of Grass turf, 4 feet wide, for the convenience of laying out the ground into beds or quarters to suit the requirements of each crop. If a vegetable garden be properly laid out, and well cultivated and cropped, it will be full of interest to all those who give, or wish to give, any thought to such matters. For a vegetable garden of this character some of the neatly-habited vegetables, such as Beet, Curled Kale, Parsley, etc., will do for edgings. A very effective edging may be had by planting a row of Parsley outside next the path, and three rows of Beet next, and beyond that may come a break of Brussels Sprout, or any other vegetable. Any land under cleanly culture, and bearing good crops, forms a pleasant sight; and a walk among beds of Onions, Carrots, Parsnips, Beet, Cauliflowers, Asparagus, Celery, etc., intersected by long rows of Peas, all full of healthful vigour, is calculated to give pleasure to a rightly-constituted mind, even if there be no formal walks and edgings.

TRENCHING AND MANURING.—There is not—there cannot be—any comparison between the crops grown on deeply-worked land and on that which is only surface-scratched. This difference will be more marked in unfavourable seasons. A cold spring or a hot dry summer has less effect upon the well-worked land, for the well-nourished plant can withstand hardships better than the starveling. But nowadays one need not use many arguments to prove that a deeply-worked soil is the best. The only valid excuse I have ever heard urged against it is want of time or scarcity of labour. Few gardeners, I imagine, are in a position to do all they would wish in this way. Still, in the growth of vegetables, trenching the land up deeply must form the ground-work of all good culture; and especially is this the case where the supply of manure is inadequate. But this, like all other matters of our daily existence, should be regarded by the light of common sense. Though trenching is beneficial, it may be the reverse to bring up too much of the bad subsoil to the surface at any one time. If the subsoil is clay, be content with bringing up a small quantity to the surface each time, and when this becomes dry gather the lumps together and burn them, spreading the product over the land. But though it is not wise to bring up the hungry soil to the top in any great quantity, it should be well broken up in the bottom of the trench with spade and pick. Where trenching is done systematically the depth is never less than 2 feet. The *modus operandi* of trenching is very simple. A trench, say from 2 to 3 feet wide and 2 feet deep, is opened across the half of the land which is to be trenched, wheeling the soil to the same end of the other half, laying it in a ridge where it is intended to finish;

the bottom of the trench is broken up with a pick, and the top soil from the next space measured off (which will, of course, be the same size), and cast into the bottom. Trenching is best done by men working in pairs. One man digs off the top, and the other shovels up the crumbs or loose mould. The first man follows on with the second spit, and the second clears up again, as before. But the second spit, when the subsoil is bad, may be only a shallow one, to avoid casting too much of the bad soil on the top where the seeds have to be sown or the plants dibbled in, as the case may be. If too much of the bad soil is placed on the top, this danger arises, that the seedbed for years to come may be made ungenial by injudicious trenching.

ARTIFICIAL MANURE.—The question, “What is manure?” may be met by the further question, “What is not manure?” The truth is, that all things which decay have some manurial value; and some things which do not decay—such as sand, for instance—may, from their mechanical action in lightening heavy land, be as valuable as manure. Artificial manures, or manufactured manures, are very largely used by farmers. Their value has long been recognised for pushing on a crop in a difficult time. In this respect it seems to me that farmers have stolen a march on gardeners, though this reproach, if it be one, is being gradually removed. It often happens that there is a greater need for economy in gardens than is generally practised by farmers. Everything in the shape of waste is gathered up and converted into manure, and by careful management and foresight it is possible to gather together annually a very large heap of manure from the waste matters which are daily accumulating. I need not enumerate them, as all are familiar with the constant accumulations of what are called rubbish about a house and garden in the country and in the suburbs of towns; and in the manipulation of the rubbish heap the careful gardener very often secures an equivalent for the farmer’s artificial manure. I have often found the advantage of freely using the compost which has been manufactured out of rubbish in covering all kinds of small seeds in a wet cold spring. However, with all the aids which economical management can obtain from home products, there is still room for the use of artificials, both phosphatic and nitrogenous; but there is a science in manuring. Knowledge is required to guide us in “what to apply, how to apply, and when to apply.” Sometimes phosphates are required, at others nitrogen is essential. Often a mixture of the two is more beneficial than either alone, and there is a wide field here for experimental research; in fact, a series of carefully conducted experiments with various artificial manures upon different soils would have considerable value.

It will be understood that, as regards the manure to be applied, much must depend upon the character of the soil and the kind of crop growing upon it. Phosphates may be beneficially applied to root crops, such as Potatoes, Turnips, etc., whilst nitrogenous manures will produce great effect upon all the Brassica family, which are gross feeders. Celery may be overfed, and if so will bolt prematurely, or have hollow stalks. To give Onions large size, with mild flavour, nitrogen is necessary. Peas and Beans do best on land in nice mellow condition from previous manuring without much aid from artificials, and what little help is given should be in a mild form with liquid manure. Artificials may be given to exhausted fruit trees with advantage. I have used guano on vine borders with considerable effect; but it should not be applied too frequently, for in course of time it acts injuriously upon the growth of foliage. Exhausted Apple, Pear, Plum, and other fruit trees may be watered with liquid manure made from artificials, or such manure as Clay's, Amies', etc., may be mixed with compost and applied as a top-dressing. In the case of old Apple and other trees, holes may be made with a crowbar, and the liquid dressing poured in two or three times a day till the whole of the soil enclosing the roots has been enriched. As regards the time for applying artificials, very much judgment is required, or the application may turn out useless. If applied in dry weather, or when the soil is very dry, most of the artificial manures, from their volatile nature, will fail in producing the desired result. They are best applied when the soil is damp, and more rain is expected. If given in dry localities, water first with clear pond water, then give the manure, following up with another dressing of clear water to carry the manure to the roots. As regards

THE APPLICATION OF YARD MANURES, which must in the end form the basis of all good culture—and under this category, so far as gardens are concerned, I include old hotbeds, which are so common in gardens—the first and chief supply of manure to the garden comes from the stables, the next in many instances arises from the collection of tree leaves and other waste matters which can be gathered on the place. If pigs are kept to consume the waste vegetables, etc., that manure also should belong to the garden. In the application of the manure to the land a great deal depends upon the character of the soil. If it be light, and of small holding capacity, the manure should not be applied long before the crop is planted, or the rains will carry its strength away beyond the reach of the roots. In dealing with such land it will be better to mix the manure with some earthy compost, which will absorb the ammoniacal salts; and this should be

applied just before the crop is planted, placing it near where the roots will shortly be working. When I had a light hungry soil to deal with, in planting such things as Cauliflowers I found a great advantage in digging a hole for the plant, placing some of the manurial compost in the hole, and setting the plant in it, making up the surface with the earth taken out. In this way excellent results have been obtained on light, hungry land. Heavy retentive land may have the manure carted on it fresh from the stables, and trenched in autumn. In the spring, after the winter's exposure, the land will be in good condition for planting.

SOMETHING ABOUT TOOLS.—Carlyle, in his grimly-humorous way, says, "Man is a tool-using animal; without tools he is nothing, with tools he is all. The earliest dwellers upon the earth had their flint ball, with a thong to it, such as no brute has, or can have." It has been said that "a good workman never finds fault with his tools;" but in gardening, at any rate, a man cannot do as much work with a bad tool as a good one. Take the spade as a case in point. A man with a worn-out spade may turn over as much or even more surface than he could with a good serviceable tool; but no one with any knowledge would say that the worn-out tool did as much or as efficient work as the good one. And if a good workman did not find fault with a bad tool, I think he ought to do so, and obtain a better one as speedily as possible. I am surprised that any one should buy a soft clumsy spade, such as is sold by many country ironmongers, when a keen, bright, handy cast-steel tool can be had for about a shilling or so more. With the improved tool the man might earn the extra cost of the spade in a couple of days at least. If I had much digging to do I would not use one of those soft clumsy spades for double wages. The spade is a most important tool in the garden, and it is very necessary in the interests of economy and good cultivation that none but the best should be employed. I have used Lyndon's patent No. 2 Spade for a good many years, and find it an excellent tool, though I daresay many others are as good. In my experience I have observed as many varieties of digging as there are spades. Sometimes the digger contrives to turn up as little soil with the new tool as he did with his old one, simply by altering the angle of insertion. It is true that he has to stoop a little more, but in a long day's digging he does not turn over so much earth by several tons; and, besides, it demoralises the man when he shirks his work. The blade of the spade should be thrust into the ground with the handle in a nearly vertical position, and the earth which is brought up by the spade should be turned completely over—that is, its position should be completely re-

versed. In winter digging, the surface of the soil should be left open and rough for the frost and snow to penetrate; but in spring and summer it should be well broken up, to fit it for immediate cropping, as spring or summer fallows are unknown in gardens. The steel fork has in some measure taken the place of the spade in spring and summer work, as it leaves the land in better condition for the atmosphere to act upon than the spade does.

For winter trenching and digging the spade is of course the best. As regards the best season to dig, most people are guided by experience and influenced by circumstances. Heavy land may be manured and the digging done in autumn or early in winter, and remain rough till spring; then, in March, when the surface is dry, take the steel fork and turn it all over, and there will shortly be a tilth fit to sow the smallest seeds upon. Light land may be turned over any time, but the manure should not be placed on sandy land in autumn, as, in consequence of its porous nature, the winter's rain will carry away a good deal of the strength. One of the most useful tools to the gardener is the hoe. There are many varieties, but for surface stirring and killing weeds the Dutch hoe is the best tool. For drawing drills and for earthing up vegetables hoes of a different character are used.

THE IMPORTANCE OF HOEING in its effect upon culture and growth cannot be overrated; therefore it is necessary that it should be efficiently done. Some men permit the hoe to glide over the surface without stirring up the soil and disturbing the weeds sufficiently deep to cut their roots and destroy them. Surface stirring with the Dutch hoe once a week or even once a fortnight in dry weather will do more good than a dressing of manure. It checks evaporation by keeping a thin stratum of loose soil on the top through which the moisture in the ground cannot pass. If the land is worked to a suitable depth, and the hoe used often enough, there will be no need for watering; but all the soil must be stirred from 1 to 2 inches deep. It is astonishing how very few men really know how to hoe; or, if they do know, they shirk their work. In earthing up vegetables, such as Potatoes, Cabbages, etc., a hoe with a blade set at right angles, or nearly so, with the handle is used. The blade of the hoe is made of different sizes to suit the different operations and operators, and in all cases a clean bright tool is handier and better than a rusty one—hence the necessity for cleaning each tool properly when put away after using. The garden rake is generally made of iron, but not always. Some are altogether of wood—in fact, the ordinary hay-rake makes a very useful tool in the hands of an active person for preparing land for seeding and such like work. I have seen

useful rakes for gravel roads and walks, with iron teeth set in wooden heads. As a rule, among amateurs the rake is too much thought of and the hoe too little; but in ordinary culture the latter is far the best tool. The rake, of course, is necessary for the proper preparation of seedbeds, but in the after-culture of the surface the less it is used the better, as weeds should never be allowed to get so large as to require removal. I have only briefly glanced at a few of the indispensable tools necessary to a garden of only moderate dimensions. There are many others, such as shears of various kinds, baskets, hammers, thermometers, wheelbarrows. Regarding wheelbarrows I may mention a two-wheeled handcart, which is very useful for the removal of Grass or rubbish. In the autumn, when the leaves are falling, something larger than a wheelbarrow is required to convey away the rubbish. This handbarrow, running on two broad wheels, is very useful; it is superior to any of the large wheelbarrows commonly employed, because it can be worked with more ease, and it is incumbent on all of us not only to economise labour, but to lighten it as much as possible. The dimensions of the handcart I am alluding to are as follows: Length, 4 feet 6 inches; width, 2 feet 6 inches; and depth, 2 feet 3 inches. The body of the vehicle is made of Elm, strong but light, and the edges at the top are protected with hoop iron. I have used a good many kinds of mowing machines, but I still retain Green's, though occasionally I have tried new inventions. Boulton and Paul's water barrels are very useful, and are the lightest things of the kind known. Tools require a tool-house, and a properly arranged set of pegs, etc., to hang up each man's tools in an easily accessible place, so that there may be no disturbance about one man taking another's tools in mistake. Very often a good deal of time is lost in seeking for tools which have been mislaid; but if each person employed is made responsible for his own tools, and for their proper order and condition, it will be an easy matter to have a well-regulated tool-house.

THE PREPARATION OF LAND.—The word "preparation" has a very wide meaning, but the sense in which I use it here is to make ready, or, as we say in gardening, get the land ready for the crop. Now, I suppose gardeners, above and beyond all other men, know the bearings of the word "preparation" upon the result of their work. The grafting of the wildling stock or the planting of the cutting is only the beginning of the preparation of the future crop; in fact, it is not really the beginning, for neither of these operations can be efficiently done without preparation. Indeed, the greatest and most important part of the gardener's work may be described under that one word "preparation." In vegetable

growing the preparation of the land is most essential ; it is, in fact, the basis of the work. The trenching or digging in winter, the further stirring in spring to pulverise the surface and fit it to receive the seeds, are all works of a preparatory character, and very necessary if we wish to obtain the best possible results. The reason why one man's crops fail and another's succeed may be summed up in that one magic word. Land that is in good heart, well manured, in good tilth, and sufficiently cultivated, may be safely reckoned upon doing its duty to any crop for which it is suitable. Capital judiciously laid out upon the land in the form of labour or manure, or both, will prove a good investment ; but more skill and judgment are required in working the land through its preparatory stages economically—neither withholding its necessities, nor casting away the chances of profit by lavish expenditure (for there are two sides to all questions, two rocks on which our bark may split)—than in following the career of the crop through its further progress till the end comes. Surface polish, the hoeing and keeping down of weeds, is a good thing for the crops ; but it is not preparation, neither can it in any sense take its place. It is the deep stirring, the thorough intermixing and the replenishing—the giving back to the earth in the shape of manure what the previous crops had taken away—which constitutes the real preparation. Of course, the forces of Nature—frost, wind, rain, and sunshine—will all work for us if we aid them by opening the earth's crust, unlocking the door with the spade, and so making a way for them to enter.

ROTATION OF CROPS.—Every one admits the necessity of this. The foundation and prosperity of all things are built upon "incessant change." It is true that there are exceptions. Onions have been grown year after year in the same ground without any perceptible deterioration. Potatoes, again, have but little change in many gardens ; but neither of these crops occupy the ground for a longer period than six months out of twelve, and during the remainder of the year the land remains idle, or is resting. We ought not, I take it, to be content with only one crop per year, especially when that only occupies the land half the year, so that if it is to be cropped as well as it ought to be there must be a rotation of some kind. I do not think any hard and fast line should be drawn with reference to this matter, for if the land is well cultivated and well manured, the question of rotation may be—not altogether ignored, but not quite so strained in its bearings. With this proviso, by way of detail I have roughly given a short list of simple rotations which may, I hope, be useful. Late Potatoes are better grown out in the open field, therefore I

have made no provision for them. First year—Early Potatoes, to be cleared off by middle of July, then sow part with Turnips, and plant part with winter Greens. Second year—Onions, followed by Coleworts. Third year—Early Potatoes, followed in August by winter Spinach and other autumn crops, such as late Broccoli, etc. Fourth year—Late Peas and Celery; the rows of Peas to be 15 feet apart, with three rows of Celery between each two rows of Peas. Fifth year—Early Potatoes, followed by Brussels Sprouts, the latter to be planted between the rows of Potatoes in June, two rows of Potatoes between each two rows of Sprouts. Sixth year—Vegetable Marrows, Turnips, Lettuce, etc. Seventh year—Carrots, Parsnips, Beet, etc., followed by Cabbages, Brown Cos Lettuces, and Endive. I do not know that I need further extend the list, as it will be seen how wide the choice is as regards garden culture; and if land ever becomes sick of any crop it must be through sheer bad management.

PERMANENT CROPS.—These are fewer in number than was formerly the case. Seakale, for instance, may be treated as an annual, as may also Horse-radish, though, as the latter is very difficult to get out of the land when it once gets in, it is perhaps advisable to keep it to one piece of land so long as success follows. Many of the so-called permanent crops are injured by being kept too long in one place, notably Globe Artichokes and Rhubarb. Four years is quite long enough for those things to occupy the land, and a more frequent change will benefit other crops by throwing more land into the regular system of cropping. It is notorious that in many gardens Raspberries and Strawberries stand too long on the same spot. Herbs, again, will be more profitable if renewed annually. Take the case of Sage, which is in constant demand. Often the plants stand to get old, and then comes a cold winter and the old plants die. If cuttings had been put in during the previous spring the young plant would have taken no injury. The same occurs with Thyme, which should be propagated either annually or biennially, the former for choice, as should also Mint. Asparagus even is coming to be regarded less as a fixture than formerly, for, even allowing that Asparagus beds of the old type will last fifty years, is it profitable to leave them so long? Would not younger plantations be more profitable? I think they would, but I shall have more to say on this subject afterwards.

Seeds.—As the future blossom and fruit is laid up in the bud of the fruit tree during the previous year, so also in the case of vegetables the character and quality of the crop to a large extent are stowed away in the seed. When we consider that most of our cultivated vegetables have been evolved from wildlings, by cultiva-

has carried on during a long series of years, and by a constant selection of the best as the seed parents, we shall begin to understand the value of breed and pedigree, and the importance of selection. Bad seeds are done at a gift. By the term "bad," I do not mean seeds of weak vitality only, as sometimes these seeds may have, from the absence of care in selection, a good deal of the wild original blood in them, and may grow with great luxuriance. All change in creation, as I understand it, are either improving or degenerating. There is no standing still. Things either get better or worse, and it is only by constant effort that the ground already won can be held. Thus, in the grounds of the seed-grower who understands his business, every plant comes under the close scrutiny of the manager, and every improvement in character is noticed, noted, and nurtured by all possible means. That is how improvements are effected, and the varieties of established merit are kept quite up to the mark. Besides the improvement derived from this source, constant persistent experimentation are trying, by circumstances, to effect a similar result. The man who sows a Pea from another's field of Peas, and saves the seeds, is simply making advantage of Nature's work, while the hybridist does the work himself. And after the latter has effected his work, and saved the seeds, he has them to select, and perhaps after all there is nothing but disappointment. The work of the hybridist is not an absolute certainty: but still anything which is followed up usually has, sooner or later, good tangible results. The reason I have referred to this matter so fully is to another my opinion that it is impossible to sell good seeds which have been carefully selected at cheaply as those on which no particular care has been bestowed, and instead of the low-priced seeds being cheap they are probably very dear. But no matter how new and good seeds may be, all will not grow and produce plants. If we select out a hundred seeds, and sow them under the most favorable circumstances, we shall not have a hundred plants. In the case of Peas, beans, and other large seeds which can be sorted by hand and all imperfect seeds taken out of sample, it is possible that from 90 to 95 per cent may produce plants; but with small seeds from 75 to 85 per cent is a very good growth. When a seed, made about a long dry and cool. If there be moisture and warmth, either a hurried growth may grow on them, the seeds may swell and burst the skin, and not reach primeval period. I have often been asked the question "How long will seeds retain their vitality?" and it is a very difficult question to reply to satisfactorily, for so much depends upon how the seeds are kept. If kept in a dry and cool room, some seeds—Rhubarb and Cucumber, for instance—will

remain their seedling a long time. I do not know that any kind has or can be fixed, but certainly seeds of the kindy named have produced healthy plants when sown many years old. But age is no advantage to seeds. Perfect ripeness is necessary, but age beyond that is no advantage. All the Brassica tribe will keep a number of years still, but little improvement; but even in this case, in my experience, after the first five or six years the number of plants raised from a given number of seeds usually increases, even when well and carefully kept. The seeds of *Barbarea* and *Barbary* should be new, or not more than two years old. But whether the seeds be old or new, we are almost sure them to fail all they have been sown a test. The way to do this is to select a certain known number, say a hundred, lay them from the stock, and sow them in a flower-pot in some new light soil, and place the pot in a heated, or some warm place, watering with distilled water when necessary is required, all the seeds germinate and the young plants appear. Seeds may be sown and placed in a warm oven with a square of glass over the top of the pot, if no better means are at hand.

Sowing Seeds.—Having obtained good seeds, we should be very careful how we sow them. There is an old proverb or maxim which says, "Sow thick and sow quick." But if we have tested our seeds and are sure of them, why should we waste them by sowing so thick? Besides, thick sowing is sometimes a very great evil; and there is always danger in the practice, for if seeds are sown during the heat of day or during a burning storm the young plants intended to be left. To a certain extent, perhaps, the matter of the old maxim was right, as it is well to have a power of selection, and we cannot have this power unless some seeds are sown that are needed for furnishing plants to occupy the ground; but very thick sowing must be wrong. Let us sow seeds during calm or mild weather, then closely, will sow so that some are much stronger than others. Take a bed of young *Turneps* and look at them closely; one plant is twice as strong as another, and if a strong plant and a weak one were allowed to grow up side by side the weak plant would never overtake the strong one. Thus, in sowing young plants in spring is an important matter. I have seen, too, sowing done in spring, taking no thought at all of the weather, and, but simply pulling up the plants indiscriminately, without any regard to strength or age. It is very certain that uselessness in this matter may lead to great loss of bulk of crop, especially with root crops; but the same principle runs through all things, and the cultivator should understand and be prepared to take advantage of the power to influence the bulk of crop which

selection gives. In garden culture seeds should never be committed to the land when it is in an unfit condition. In the short statements upon the different vegetables which will follow this, the best times to sow and plant will be given, but it should be understood that everything should be subject to the condition of the soil. Better—far better—to wait a week or longer and obtain a good tilth than sow in an ungenial bed. In dealing with cold heavy land the crop often derives very great advantage if the seeds can be covered with a light suitable compost, which should be provided for when the autumn clearing-up takes place. My usual plan is to save the best of the charred material, which is not likely to have any living seeds of weeds in it, for covering small seeds in spring. All seeds should be sown in drills, because of the advantages the plan offers for surface stirring and cleaning, and seeds in drills are easily covered. As regards

THE PROPER DEPTH OF COVERING, this is one of the subjects which cannot be definitely stated. The nature of the soil, the season of the year, and the size of the seed will all have some influence. Seeds sown early in the season should be covered very lightly. Peas, for instance, planted in January, may be sown on the surface, and have 2 inches in depth of the warm surface-soil drawn over them; but Peas sown in May will do better at the bottom of a trench with 3 inches of soil over them. Turnips, again, when sown in spring, should be in shallow drills; but in hot weather in June the drills should be deeper to give the roots of the plants a chance to strike down into the moist soil below. If the land has been well prepared the very smallest seeds will easily push through a quarter of an inch of light soil, though in many cases less than that will suffice.

SAVING SEEDS.—To a limited extent this is probably done in all gardens—as in the course of time every person has some favoured plant which he thinks is better than other people's, and in order to retain it he must save seeds. Very great care is requisite with the Cabbage tribe, as they are so easily hybridised by insects, and the seedlings would be useless. Therefore only one variety or species of the Brassica family should be allowed to flower at the same time, if seeds are to be saved, unless they are some distance apart. But having saved seeds from a good strain of Cabbages or Brussels Sprouts, if they are kept carefully they will last several years. There is some advantage in this, as then we need only save seeds from one kind in one season. In saving seeds from such things as Beet, Carrots, or Turnips, first of all select one or two handsome roots, and save from them, sowing those much later in the season than customary when one sows for a crop,

and transplant them in spring for producing seeds. A much better crop will be obtained in this way, and they will be quite as good and true as if saved from the selected roots themselves.

TRANSPLANTING.—Where the plants are to remain, sometimes it is an advantage to sow such things as are commonly transplanted. Gardening is such a many-sided business that it is never wise to dogmatise. On some soils, in a dry hot summer, Cauliflowers and Lettuces are best sown thinly, and not transplanted; but in a general way removal does good. There is no doubt, I think, that a plant allowed to remain where the seeds drop acquires greater strength than if the tap root is destroyed by removal. But with the majority of cultivated plants the destruction of this tap root is a benefit, because it leads to the production of an immense number of fibres, and increases the feeding capacity of the plant. In most cases early maturity is of so much value that even if transplanting was not in itself a recognised benefit it would be well to do it for its forcing effect. In most cases transplanting hastens the plant's life's work. A Cabbage, Cauliflower, or Lettuce comes earlier to market when transplanted. Instead of the plant having only one main root which descends perpendicularly, it has a number of smaller roots spread out horizontally near the surface and well within the influence of solar warmth. Transplanting fruit trees occasionally keeps them in a healthy fertile condition. Most flowering plants are much benefited by transplantation; in some cases the period of flowering is quite changed by it. Take the case of the Russian Violet. If allowed to remain long in one spot it flowers only in spring; but if brought under a regular system of cultivation which involves annual transplanting, it becomes an autumn and winter bloomer. Shrubs intended for winter forcing must be frequently transplanted to build up the requisite fertility of blossom buds and fibrous roots to support them. This, then, I take it, is the general effect of transplantation—it hastens fertility in the fruiting and flowering plant, and shortens the probationary time of the vegetable. There are, of course, some things to which transplanting brings no benefit in a general way, but which under special conditions and circumstances it helps. Take the case of the Potato. If we save seed from a choice variety, we sow it in a pan or box, and when strong enough we transplant the seedlings with great care; but the transplantation of Potatoes forms no part in the general system of culture adopted by the best cultivators. I mention this, and many other things which occur to me, in the way of elucidation, to show how elastic are—and, I might add, should be—the rules and laws by which gardening is governed. Gardening is not, and never can be, an exact science,

because the conditions under which it is carried on are too indefinite and changeable; and in some respects gardening would lose much of its charm if the desired result could be obtained by the same means everywhere.

CHAPTER II

Cropping the South Border.—No matter how small or badly situated the garden may be, there must be an early border, where vegetables and salads may be sheltered and their growth hastened. It is an advantage if this border can have a sheltering background, such as a wall, hedge, or bed of shrubs; or, if nothing of the sort is available, make a rough fence with some stout laths, and line it with straw or reeds. Early produce is so valuable that every effort should be used to obtain it. Having marked out the site in a suitable situation, if needful a drain should be made. In very cold situations, where the subsoil was a cold heavy clay, I have known it pay to take out the soil 18 inches deep, and place in a layer of brick rubble and stones. When the bottom is made dry and comfortable the soil of the border can be improved gradually, as means may be found. The surface should possess a good fall to the south to catch the early sunshine which is so valuable to the early struggling crops. Burnt earth, the sweepings from the potting shed, and other sundries, in the way of odds and ends of composts, should be reserved for the early border until the soil is a yard deep, and then it will grow anything. Plants growing on a shallow soil, if the situation be dry and warm, soon suffer for want of moisture, and it is absolutely necessary that the early border have depth of soil. Among the early vegetables which are indispensable, and which cannot be obtained too soon, are Peas, Potatoes, Cauliflowers, Cabbages, Horn Carrots, Turnips, Lettuces, and Radishes. The rows of Peas may come at intervals of 12 feet or so. Some people sow first in November, and in sheltered situations there is not much risk run on a warm dry site. I have discontinued sowing Cauliflowers in August, preferring to sow about the end of November on a shelf near the glass in one of the houses, pricking the plants off into single pots when large enough, still keeping them in a gentle warmth near the glass, and hardening off and planting out about the end of March or beginning of April. Plants raised in this way never bolt, and there is a degree of certainty about them which no other system gives; and as each plant is kept in a pot by itself, there is no check when planted out. French Beans may be raised in pans or boxes, and planted out

when the weather settles. If need be, Lettuces can be raised in a box in heat, and planted out when large enough. Excellent results are obtained in this way, and still further to hasten such things as early Horn Carrots, or Turnips, etc., the earth may be taken out and the trench filled with hot manure, the soil being replaced and the seeds sown. A good deal may be done in this direction where the necessary judgment and care are forthcoming. If we have plenty of hot stable manure, in January open a trench, 3 or 4 feet wide and 2 feet deep, fill it in with stable manure, tread it down, and re-turn all the best soil.

As soon as the earth gets warm sow the Carrot seeds, and cover the bed with two thicknesses of fishing-net. There is a great deal of warmth in a covering of old fishing-nets—more than is commonly imagined. The same process will secure early Turnips or Potatoes. Such a border may be thought too valuable for early Cabbages, but a very early spring Cabbage is always appreciated, and a week in point of forwardness is worth trying for. One of the early kinds, such as Atkins's Matchless, should be planted about 1 foot apart each way. A very small bed will suffice. The rows of early Potatoes may be hooped over, and covered with mats sewn together, so as to be drawn on and off quickly. Canvas would answer the same purpose. Radishes and small salads can be located in nooks and corners. If birds or mice are troublesome among the seeds, dress them with red-lead; they will not touch them then; and no remedy is more easily applied or less costly. The seeds are poured into a basin damped slightly with water, then the red-lead (a dry powder) is scattered over them, and the seeds are stirred about till each has taken on the coat of lead and becomes dry. They are then in a fit condition for sowing. As fast as the early crops are cleared off, summer crops will follow, such as Tomatoes, New Zealand Spinach, Vegetable Marrows, Cucumbers, Capsicums; herbs, such as Basil and Marjoram. The border should never be idle, and as far as possible a suitable rotation should be kept up.

WATERING.—There is no question about the value of water to a thirsty land. The withered plant immediately recovers under the invigorating influence of the gentle shower; but artificial watering is seldom so thorough as to be really serviceable. In this little island home of ours we rarely regard this question from a really practical and economical point of view. The reason perhaps is that hot dry summers have of late years been the exception, not the rule. Dragging water by hand labour is not only very hard work, but, judged by results, is not economical. In these days of improved machinery, the distribution of water over the land in a dry time should not be a question of waterpots.

Irrigation, to be of great value to the crops, must be efficiently done; and in the majority of cases, if the water has to be carried in waterpots, it will not be so done. I have seen this often. If a set of men are ordered to water any given area, unless they are told how much water is to be used, the work is sure to be scamped. This may perhaps arise through some confusion of ideas as to what constitutes a good soaking of water. Scarcely any two people who are not really and practically acquainted with the subject will agree as to the amount of water any given space should receive in dry weather to suit the wants of any particular crop; but it is certain that the majority would not give enough water, and very many would be content with just damping the surface. If, from the deficiency of the water supply or any other cause, the soil watered cannot be moistened as far as the roots extend, it will be better not to water at all, but to counteract the drought and encourage growth by other means. In the neighbourhood of towns, where the water is laid into the houses, and can be easily distributed by pipes and hose, the garden may have a good supply. Whenever a bed of plants is watered in the open air, the earth should be stirred next morning to prevent baking and cracking by the sun, and check evaporation.

With the Dutch hoe a very few minutes will suffice to stir a large space, and it is wonderful how quickly the water ascends into the clouds again if this stirring is neglected. The best water is that which has been exposed to the atmosphere and the sunshine in an open tank, pond, or river. The water from a deep well should never be used until it has been exposed for twenty-four hours—it chills too much. Plants watered with cold pump or spring water cannot thrive. It should also be borne in mind that large quantities of water cannot at any time be passed through the land without making some change in it. If the water contains any manurial substance the earth acts as a filter. If, on the other hand, the water is clear and the soil rich, or fairly so, the latter may part with some of its richness to the water on its passage through, so that watering in all cases may not be an unmixed good, but, if inefficiently done, a positive injury. On this latter point I may say that surface watering—*i.e.* just damping the surface an inch or two deep—must do harm, even when carried out persistently, by the encouragement given to surface-rooting, which, however valuable when legitimately produced, is of no use when created in such an artificial manner, being too much under the influence of a set of circumstances whose permanence cannot be relied on. What plants, as well as animals, require is steadiness of treatment; and plants with a thin stratum of soil just

above their roots, moistened every twenty-four hours, are exposed to fluctuations not favourable to steady growth. I have seen them exposed to this treatment, the leaves shrivelling with the heat, and the edges all scorched and brown, arising from the alternate drought and moisture, chills, and heats of surface-watering. The best time to water is in the evening, when the sun has lost its power.

MULCHING.—This term, as well as its object, is now pretty generally understood. In dry summers 3 inches of manure or Grass, or a loose surface of soil, conserves the natural moisture of the ground, and tends to keep the earth at an equal temperature. It saves an immense amount of labour in watering; indeed, watering is but a sorry substitute for mulching. If Peas are mulched 18 inches on each side the rows, the earth will be kept cool; and if it should be necessary to water, the moisture will remain about the roots of the plants, instead of escaping into the air again within a few hours of the time it was given. Mulching the rows of Peas will do much to keep off that dire enemy, mildew, by preventing the check which leads to it. The spores of mildew are doubtless always in existence. It is only when plants are in a fit condition (arising from stagnation of some kind) for their reception that they do real harm. Mulching of Lettuces and other salad plants not only saves labour, but gives a freshness and crispness to the produce that cannot be obtained by any other means. Mulching Black Currants, Raspberries, Strawberries, and nearly all kinds of fruit is absolutely necessary to their welldoing. The mulching of wall trees, especially those on the south wall, saves a deal of watering, or, at least, it would do if the trees were to get their wants supplied, but in many cases I am sorry to say they do not. This arises in some instances from lukewarmness, in others from sheer carelessness. A mulch over newly-transplanted shrubs or trees is of great benefit—more so, in fact, than anything else which can be done; and it is very rare that a plant well mulched dies through removal. Mulching is as important among flowers as it is with fruits and vegetables. A good mulch several inches thick over the most delicate Roses, including the Teas, will generally save the main roots, so that the plants can start again, and a mulch of Cocoa-fibre over choice bulbs in winter will be a great help. Often, in sheltering a plant whose hardiness we are not quite sure about, a mulching round the crown will save it.

SHADING.—Shade to a newly-transplanted and, consequently, disrooted plant is of great value in mitigating the effect of a check in the case of any production such as Celery, where the application

of shade, by laying green boughs across the trenches, is so easy. In transplanting small plants during a short spell of bright sunshine in spring or summer, a few branches, placed upright in the ground amongst them, are a very great help, by keeping the soil cool till the roots begin to work again. I have often experienced the use and benefit of this, and the trouble is almost *nil* when one is living among trees which can spare a few branches. Again, in sowing seeds, there is no difficulty in getting the smallest ones to germinate in the hottest and driest weather if the following course is adopted :—Moisten the land well before sowing, stirring it about with the fork to make sure that all the soil is moist, then rake smooth, sow the seeds, and shade by laying mats or Rhubarb leaves on the bed till the seeds germinate ; green branches will do as well—in short, anything which keeps off the hot rays of the sun. The periods of bright hot weather will probably be of short duration, and by the time the plants are up the weather may have changed, and the shading can be dispensed with. Some people say “Wait for rain,” but I do not believe in being controlled by circumstances, if it be possible (which it generally is) to overcome them. Besides, a week or a fortnight may be lost, and can never be altogether recovered. Another and a very easy way of shading is to cover the seed-beds with netting, in the same way as we protect from birds. The farther away the nets are from the beds the better. A single fold of old fishing-net for shading and sheltering is far more effective for both purposes than those who have not experimented with them will be prepared to admit.

SHELTERING.—I have already adverted to the benefits arising, in the way of shelter and protection, from a single fold of netting, such as is commonly used for protecting fruit in summer from birds. Any one can try the experiment for himself. Here, say, we have a bed of Lettuces, Cabbages, Cauliflowers, or any other early crop—one half is covered with netting, supported on forked sticks, or something of sufficient strength to keep the netting firmly in position. The covering should hang over on the sides, and be pegged down to the ground. The other half of the bed should be altogether exposed. The first question which arises in the mind of the inexperienced is, Of what use can such a thin covering be to any crop ? It breaks the wind, cuts up the cold icy currents, and secures a quiet shelter whilst the storm rages outside. If on a cold windy day in winter we stand on the lee side of a White Thorn hedge—though it may be nothing more, perhaps, than a very narrow line of leafless twigs—yet how it shelters, how it extracts the icy coldness from the east wind as it filters through ! The netting acts in the same way as the leafless hedge, by breaking up and separat-

ing the particles of icy wind as they sweep across the garden. Gardening is very much a business of expedients, of making the best and most of things ; and in the matter of shelter a great deal may be done with cheap and simple means. Shelters made of Reeds secured to a thin structure of deal laths, made movable at pleasure from place to place, are very valuable. Evergreen branches of Yew, Laurel, or Box are useful in early spring for sheltering rows of early Peas or Beans. The Bracken Ferns, cut just before the fronds change colour, when dried are tough and lasting, and excellent for protecting anything which requires it. A few fronds thrust into the head of a Rose, or scattered over its roots, may save its life in a severe winter, and the same course can be adopted with any plant of whose hardiness we are doubtful. On the rockery, plants which may be quite hardy enough to stand a severe winter when it comes in regular order, and continues steady till it departs, may succumb to an alternate freezing and thawing, which is the usual characteristic of our winters. In this case a sheltering mulch of Cocoa-fibre or dry peat is of much value in protecting the roots from the sudden changes. The dry Fern will be most useful for sheltering the Celery, Cauliflower, and Lettuce, and many other things, during a severe frost. Dry Rushes, which may be cut from marshy ground, are valuable for the same purpose, as is also damaged hay or dry litter of any kind. It is best, in sheltering from frost anything which is moderately hardy, to let the ground get frozen a little first. As a rule, when a severe frost is coming on there are signs of its approach—a sort of skirmishing frost or two before the real enemy comes. When the ground is crumbled over by the first frost, and the wave of cold air is in waiting, apply the coverings and make all snug ; and as long as the frost continues, whether it be a long period or a short one, they should remain. Do not be in a hurry to uncover when the frost breaks up ; wait a day or two for the warm genial air to penetrate the covering, and raise the temperature round the plants, as sudden changes are bad for vegetable tissues.

WEEDS AND WEEDING.—Weeds occupy a prominent position in the economy of the garden and farm. Some people think and say that weeds are evil things ; that there is no good in them ; that, in fact, they are the millstone which continually hangs about the cultivator's neck. In the same sense in which dirt has been described as being only matter in the wrong place, so weeds represent matter converted to a wrong purpose, though they serve a good end in stimulating that industry which keeps the crops up to their work. Archimedes is reported to have said that if he could obtain a fulcrum he would invent a lever which should move the

world ; but, as I take it, industry is the motive power of the world—all things yield to it. And who can say how much of this industry, so far as the cultivator is concerned, is consequent upon the growth of weeds? If there were no weeds the dullard and sluggard would never hoe their crops, and the plants would lack one great incentive to a rapid healthy growth ; so that altogether, when rightly viewed, I am disposed to take a charitable view about weeds. Until they gain the mastery weeds may be regarded as friends in disguise ; but if not rooted out they are a great evil. When the weeds are small, a man with a Dutch hoe can run through a large piece of ground in a short time. If the work is done on a fine sunny day thousands will perish, and the plants receive that impetus to renewed growth which a freshly-stirred surface always gives. I once told a gentleman, whose garden was in a bad condition from the presence of so many weeds, that one year's seedling caused seven years' weeding. He could not quite see the force of the aphorism, but he lived to realise its truth. It is much easier, and I need not say a great deal cheaper, to have land clean than weedy. I have heard a farmer complain that he spent more money in labour per acre than his neighbour did, and yet his neighbour's land was cleaner than his. He could not understand this, or professed that he could not, although the matter was plain—one man went into the fields early with the hoe—the horse-hoe where it was practicable—and elsewhere the hand-tool was employed. It is an old saying, "There is more work done with the head than the hands," and work which has been well thought out beforehand is usually better done. A supreme effort should always be made to cut down the weeds when small, so that they may lie on the land and die. When a piece of land becomes weedy it forms a happy-hunting-ground for snails, slugs, and other deleterious things, which, like weeds, when numerous, are evidences of neglect. A well-cultivated and clean garden is not so much infested with the gardener's enemies, for the simple reason that they will not live where a man is always beating up their quarters. Depend upon it there is nothing like good cultivation, which is implied in the words "deep culture" and frequent "surface-stirring," for getting rid of weeds, slugs, snails, caterpillars, larvæ, maggots, etc., which give so much trouble. It is an admitted fact that weakly plants are more exposed to the attacks of their enemies than those in vigorous health.

CHAPTER III

The Potato.—I remember the time when the Potato disease was so virulent that the minds of men were in a state of agitation from doubts and fears as to the possibility of continuing the cultivation of the Potato; but that feeling has disappeared, and of late years its cultivation has increased enormously. In the large Potato-growing districts the disease does not now cause so much alarm as it formerly did, chiefly because the cultivators have learnt that, to a considerable extent, the matter is in their own hands. At the time when the *savant* and scientist were both at their wits' end, the practical cultivator, nothing daunted by the sayings of the wise men and the learned talk about the *Peronospora* and the resting spores, set to work to raise new varieties possessing greater vigour of constitution, wisely considering that if the enemy to be faced was a fungus, the best remedy was to increase the strength and vigour of the plant—not by an excessive application of manures, which would encourage a plethoric habit, and render the plant more susceptible, but by planting thinner, to encourage robustness of stem and strengthen the fibres by the free admission of light and air. Of late years, in addition to the attention which has been given to robustness of constitution, as exemplified in such kinds as *Champion* and *Magnum Bonum*, a more rational system of culture has been adopted. The plants have had more room to grow, and a freer exposure to sunshine and air has given it a greater power of resistance to its enemies. Then, again, the seed Potatoes have been treated in a more rational manner. It is true that many of the choice old kinds of Potatoes have nearly disappeared; but no matter—Potatoes of excellent quality are plentiful and cheap everywhere.

PREPARING THE GROUND.—The best land for Potatoes is a deep, dry, sandy loam. If they must be planted on cold damp clays, throw the surface into ridges, and plant one row on the crown of each ridge. They should be about 5 feet apart. More Potatoes will be produced in this way than if they are planted on the level at half the distances apart, and there may be a row of Cabbages or some other crop grown between. A friend of mine sows a row of Turnips between each two rows of Potatoes. It is especially necessary that the ground should be thoroughly prepared for Potatoes by exposure to the atmosphere in winter. Land roughly trenched or ridged up in December or January is in good condition for planting the last half of March and the first half of

April. Heavy land may be manured at the time it is turned up, but the manure for light land should be worked into a compost by mixing earth and any other manurial substance with it, to increase its bulk, and fix the ammonia which is commonly evolved in fermentation. This compost may be placed in the drills at planting time with the Potato sets. I like to sprinkle the compost over and between the sets, as then I think the Potatoes receive the full advantage of it. There is no doubt that Potatoes are gross feeders, and if we could ensure dry seasons in July and August they would utilise profitably very liberal dressings of manure; but for producing Potatoes of good quality the compost I have recommended is better than richer manures. In Potato-growing districts, even where the land is in good condition, artificial manures are largely used. It is not easy to say

WHICH ARE THE BEST MANURES for Potatoes on all soils, but experience points to phosphates as being best and most profitable to use. Probably on poor soils guano or manures rich in ammoniacal salts will be better, or a mixture of the two; at any rate, the land must be in good condition if 5 cwt. of phosphatic manures per acre cannot be profitably used. The next question is, When should the manure be applied? In field culture it is generally given at the time of planting, scattering it along the drills and covering it in with the plough with the Potatoes; but in gardens the manure may with advantage be given at two periods, viz. one at planting time, scattered along the drills, and the other, half scattered between the rows, just before moulding up.

PREPARING THE SEEDS.—This question has assumed a wider significance of late years; formerly it was thought anything would do to plant, and this carelessness about the seed Potatoes doubtless had something to do with that deterioration which opened the way for the attack of the *Peronospora*, which created such a panic throughout the land. The seed Potatoes should be selected at lifting time, and be spread on the floor in an open shed or some airy building. Here they lie till the skin gets set and hard, then they should be packed in shallow boxes and placed one above the other in a building where air and light can enter freely when not freezing, but where the means exist of keeping out frost. The early kinds may be placed in single layers, crown upwards, in shallow boxes or trays, and put under the stage in the greenhouse; or the Orchard-house is an excellent situation for them if the frost is kept out. In such a light airy situation the central eye in the crown soon takes the lead, and when planted out only one stem appears. Such plants come in earlier, and the crop is more even in size. Early Potatoes, at any rate, should never have more than

one stem, and the plan of starting them in a light place where the smallest possible amount of growth can take place by the encouragement given to the central eye conduces to that end. But the system that is good for early crops is also good for others, so far, at least, as regards the management of the seed, if more care is taken in its selection, and it is kept afterwards in a light place where no undue crowding or heating can take place, for it should be borne in mind that the cause of Potatoes growing so much when laid in great heaps in the field or in store is from their heating, causing the buds or eyes to start. If they were laid thinly on a shelf or floor they would not grow to any injurious extent. If they must be kept in bulk in buildings, from the space being limited, and the quantity grown large, they should be frequently turned over. If the seed Potatoes in winter could be turned over once every week or ten days it would prevent those long chits or sprouts breaking out. All vegetable substances when laid in large heaps generate warmth. Potatoes are no exception to this rule, and this is the reason why they grow more when laid in large heaps than when in a thin layer. When these heaps are turned over, the continuity of condition so necessary for growth to take place seems to be snapped; and if this disturbance is effected at frequent intervals, the growth will not be very much in excess of requirements. It is quite certain that when the substance of the Potato is uselessly employed in producing growth which cannot be utilised, the stamina of the plant which is finally emitted from the tuber must be weakened thereby; and not only will the crop suffer, but the stock which is constantly treated in this way must deteriorate and become more susceptible to the attacks of any parasitical pests which may be floating about in the atmosphere seeking for something suitable to settle upon.

WHOLE OR CUT SETS.—The question as to which are best has often been discussed, and is exceedingly difficult to decide, for when one, by a long series of experiments, has come to the conclusion that certain conditions or kinds are best, something occurs which shatters his beautiful theory to pieces. Like many others, I have bought new Potatoes in single pounds, have cut them up in single eyes, and planted them with varying results, but generally of a very satisfactory character. In dealing with very choice new kinds the single-eye system is excellent. That it will give the best result from a given quantity of seed is certain; but will it do so in ordinary culture against well-selected seed? In a general way, of course, the selected seed uncut would beat all comers; but I have had very good results from single eyes cut from very large Potatoes. It is, of course, a well-known fact that the eye in the

centre of the crown is the most prolific eye in the tuber, no matter how large that may be. In that central eye the greatest amount of the plant's growing force is concentrated. The other eyes will all, or nearly all, grow when cut out separately and planted, but they will not produce so heavy a crop as the central eye. Some cultivators, in order to give this eye a better chance, and to remove all competition, cut away, a few days before planting, the other eyes which are prominent and likely to be the greatest competitors, if all were left. I have a friend—a large Potato-grower—who always contends that the larger the Potato sets the better, but he says that a large set should be allowed more room to grow than a smaller one. After the Potatoes come up, I have often, when a large number of stems spring away from one set, had them thinned with manifest advantage by pulling the weakly stems away, leaving two or, at the most, three to furnish the growth to the plant. I am convinced that a great cluster of many stems is an evil; though it may probably lead to an increase in the number of tubers, it will not give bulk of marketable ware. On the whole, the best results seemed to be obtained from moderately-sized whole sets, and, if any are cut, the severance should be made straight through the cluster of crown eyes, so that each may possess one or more of them. The cutting of the seed when cut Potatoes are planted should take place three or four days before the planting, and some people take the precaution to apply a dusting of quicklime as a styptic.

CHANGE OF SEED.—There are some, I believe, who doubt the value of this; but the evidence which has come under my notice, where seed from Scotland has been largely used, forces me to draw the conclusion that a change of seed, especially from a high latitude to a lower one, is exceedingly beneficial as regards the quantity and quality of the crop for two or three years, and then the influence becomes less and less, until it is altogether lost, showing that the seed should be changed every two or three years to obtain the full benefit. I know growers in the Fens who annually import a portion of their seed Potatoes from Scotland, and find it answers their purpose to do so. All changes may not be so beneficial as this. I can quite understand that some changes may not be of advantage. To be useful the change must be of a radical nature. The conditions under which the seed has been grown must be of quite an opposite character from those of the place they are brought to. I grant that, where great care is given to the selection and keeping of the seed, and where the stock has reached a high pitch of excellence, to exchange such seed for stock of an inferior description will be going backwards—not forwards; but I do not think this is any argument against a change of seed generally.

WHEN AND HOW TO PLANT.—If the Potato were not so susceptible to frost, the time and manner of planting would have less importance. In the early border, where the soil is warm and dry, the old Ashtop and Veitch's Ashtop may be planted about the first week in February, or as early in the month as the weather is suitable. On dry warm soils, as regards the early crop, I have had a fair amount of success from planting in November, burying the sets 6 inches deep. It simply amounts to this: I think there is less waste going on when the tubers are in the ground than when exposed to the air, even if the central eye is pushing steadily onwards; and as soon as the earth closes round them they begin to make roots. Though they may not appear above ground earlier than if planted in February, they have a greater hold of the soil, and are consequently better prepared for any vicissitudes of temperature, etc., which may assail them. As regards the general crop, there are few places in such a favourable condition as the early border for autumn planting, and it is only under favourable circumstances that autumn planting will succeed. Besides, even if such planting were always a success, it is a question if it would be always desirable. When the Potatoes are planted in spring the early crops may be cleared off, and the land planted with something else in autumn; but with autumn planting, instead of the land being occupied some six months or so, at least nine months would be taken up with the Potato crop, and the advantages in favour of autumn planting must be very marked before it will pay to give up the land for so long a period. Except in the case of the very early crop, March is the best month for planting. In cold late districts the first half of April will be early enough to plant the main crop. The best way to plant Potatoes is to draw drills 4 inches deep, and lay the sets 12 inches apart along the bottom, scattering the compost over them, and then covering them with a hoe. The best implement for drawing drills is a long-bladed hoe, fashioned like a carpenter's adze, and about the same length in the blade. The easiest and quickest way to plant Potatoes is to use the dibble; but the plan has no other recommendation, and it can only be employed when the land is in good heart, and does not require manuring. I have left the question of the distance between the rows open, feeling that no hard or fast line should be laid down; but none of the main-crop Potatoes should be less than 3 feet apart, and such large-topped kinds as Reading Hero should have 4 feet.

SPRING AND SUMMER CULTURE.—When the tops of the Potatoes make their appearance, take the fork and loosen up the soil between the rows. This is specially necessary on heavy land: on light

land a deep hoeing will do ; but a free and deep stirring of the soil between the rows is very beneficial, and should be repeated at least once before earthing-up. This operation should take place before the Potatoes begin to run. A good deal has been written lately about the Jensen system of culture, which consists chiefly in drawing up the soil in a sharp ridge round the stems. Though I believe—in damp soils especially, and in rainy districts—drawing up a good sharp ridge of soil is very beneficial, there is no great novelty in it, and the cost of labour, if the work had to be followed up persistently, would destroy all chances of profit. The conclusion I have come to is that the Jensen system will never have much influence upon Potato culture in this country. If the stems are too numerous, the weakly ones may easily be drawn out when they are 5 or 6 inches high ; and if there is any evidence of weakness, just before earthing-up scatter a little artificial manure by the side of the rows. This is best done in damp weather. In the Fen districts very large quantities per acre are sometimes used on the Potato land.

LIFTING AND STORING.—In garden culture there is an advantage in growing early and second early kinds only, as then the greater part of the crops may be lifted before the disease makes its appearance. As soon as the skins are set the crops may be lifted and pitted if there is no cellar or other building to stow them in. There is no better way of keeping the Potatoes intended for use than placing them in pits or ridges on some elevated site, not laying too many in a heap, and placing plenty of earth over them for the double purpose of keeping out frost and heat.

BEST KINDS TO GROW.—In the present day Potatoes are grown for two separate and distinct objects—viz. for table use and for exhibition. Taking a broad view of the case it is certainly more important that the quality of the Potato should be considered before its appearance, though in some cases we get beauty and quality combined. The Schoolmaster, for instance, is good all round. As regards Potatoes for market, none, in my experience or knowledge, has so high a reputation as the *Magnum Bonum*. The *Champion* is wearing out—its constitution seems to be declining, which is, I think, a pity, for, in my opinion, it is superior, when properly cooked, to the *Magnum* ; but I grant that it is rough in appearance, which involves waste. Another Potato which had a very high character (I am referring to *Reading Hero*) has disappointed some people who have grown it largely in the field. From its behaviour in the garden with me I think much of it ; its quality, when cooked, is very superior. It grows luxuriantly and must have plenty of room. Though I gave it 3 feet

between the rows it was not enough, as the rows on the outside of the plot proved when the crop was lifted.

Potatoes for the Table.—Royal Ashleaf, Myatt's Prolific, Forty Fold, Beauty of Hebron, Sutton's Early Regent, White Elephant, Schoolmaster, Excelsior, International, Magnum Bonum, Reading Hero, and Champion. This list might be extended, but the above have been selected for general usefulness as well as being good croppers, and they are, to a certain extent, disease-resisting. Some are good in one place and fail in others, but they will be found fairly good all round. I do not care much for the White Elephant; but it does well and is liked in some places.

Exhibition Potatoes.—Lady Truscot, Reading Russet, Snowdrop, Radstock Kidney, Vicar of Laleham, Porter's Excelsior, Beauty of Hebron, International, Vermont Champion, Schoolmaster, Sutton's Early Regent, Matchless, Red Emperor, Sutton's First and Best, Queen of the Valley, American Purple, Myatt's Prolific, Triumph, Pearl, and Pride of the Market.

DISEASES.—The curl is a very old complaint, and the wireworm has now and again made his presence felt. There was not much to complain of till the fungus now known as *Peronospora infestans* made its appearance in 1845, I think—I am writing from memory—and then for quite a number of years the prospects of both Potato-growers and consumers were dismal. In looking back over the intervening years and considering the various theories of cause and the cure promulgated, it is rather amusing to see how little came of all the nostrums. I believe the best thing I ever tried was a dusting of newly-slaked lime over the foliage when the disease first appeared, before the tubers were affected at all; but the interval for the use of this is so limited that it is only useful for a small garden patch. The real remedy for the Potato disease is now in operation in many places, and it may be called improved culture carried out by common-sense methods. Firstly, by selecting the right kind of soil, and giving it a thorough preparation by deep culture and trenching, as well as by exposure to sweeten and pulverise it. Secondly, by selecting the best seeds and keeping them in proper condition, so that no exhaustion takes place from undue growth—those kinds possessing vigour of constitution, as denoted by strength of stems, to have the preference. Thirdly, by giving plenty of room when growing. These three sections may be amplified so as to include everything common to first-class culture.

CHAPTER IV

Culture of Asparagus.—A deep, rich, sandy loam is the most suitable soil, and if suited in this particular, the climatic conditions can hardly be unfavourable. I know a garden—Rangemore Hall, Burton-on-Trent, Staffordshire—where a good deal of expense has been incurred with Asparagus, and yet it will not succeed; the plants dwindle and die. The situation is an elevated one, and the soil a cold heavy clay. The Asparagus being a Fen plant in its wild state, the natural inference is that a deep, rich, light soil, rather retentive of moisture than not, is best for it; and heavy clay, in the higher regions of the country, the worst.

PREPARING THE LAND.—The old-fashioned plan of growing Asparagus in beds is giving way to the modern system of culture in single rows, at rather wide intervals. When we know the requirements of a plant, the best way of working up to these should be kept steadily in view, although we may not be able to accomplish everything at once. Asparagus does not thrive well in cold heavy clays, but in the majority of instances the natural soil may, at a reasonable cost, be so altered as to be rendered suitable. The first thing to be done in such cases is to burn a lot of the clay and use the ashes to open up the remainder, and then add as much manure, sand, and lime as can be conveniently obtained. This work should be done in autumn, say in September and October; and after trenching and intermixing, the surface should be left rough till March. To obtain fine produce there must be vigour and strength of crown; and though much of this vigour may be obtained by increasing the space commonly allotted to each plant, yet, in order to sustain them afterwards in a vigorous condition, the land must be well done. In Asparagus culture, all other things being equal, success is usually in proportion to the land's condition, which cannot be kept up without a good deal of manure, and it is very important that the land should be well prepared at the outset.

RAISING THE PLANTS.—This is always done from seeds sown in spring. Asparagus, even under the most favourable circumstances, requires a good deal of time before it yields any return. It is not often that any produce can be cut before the third year after planting unless very strong roots are planted, and if anything can be done to shorten that long probationary time it is worth knowing. When plants have to be bought I have always used those of

one year's growth from the seed ; but if the land is in first-rate trim in March I should prefer to sow the seeds in the place where they are to remain. Transplanted plants always lose a little time in establishing themselves, and if they are kept out of the ground any length of time they will lose strength. In making an *Asparagus* plantation on a site not quite first-rate, it is far better to sow the seeds on the site and not transplant, than to buy ; and it would be the worst practice to import plants from a superior kind of soil to an inferior one, as the probability is that many of them would dwindle and die, and the plantation be a failure. I remember a case where a clergyman, living in an upland district, had a present of a lot of one-year *Asparagus* plants from a friend living in the Fens—strong vigorous plants, with robust-looking crowns ; but they could not accommodate themselves to their altered circumstances, and turned out a complete failure. Had seeds been sown on the spot, and the young plants thinned out to the requisite distance when large enough to make a selection, time would have been gained. In fact, I always think *Asparagus* plants should be raised at home, if possible. Where sowing on the site of the proposed plantation is not convenient, it is customary to sow and prepare the bed in some other part of the garden. Sometimes the seeds are sown broadcast and covered from a quarter to half an inch deep with light rich soil, and if the surface of the soil be dry, just flatten down with the back of the spade ; but I prefer to sow in drills half an inch deep, and about 8 or 9 inches apart, as the plants will only occupy the bed one year. Another way of raising *Asparagus* plants, and by which some little time is gained, as the seeds take a long period to germinate, is to sow in boxes about the middle of March, and stand the boxes in a gentle hotbed till the seeds germinate, and then move them to a light position close to the glass to strengthen and prepare them for planting out. The transplanting from the boxes to the beds must be carefully done, so that none but the very longest roots may be lost ; and the shortening process to which long roots have to submit in transplanting is not altogether a loss, as it generally leads to the gain of a great many roots perhaps better adapted for carrying on the work of the plant. Whether we transplant from the seed-bed or from boxes in the way last suggested, some time during the month of April (early or late in the month, according to the season) is the best time to plant. If there is space under glass some time will be gained by sowing the seeds in February in pans or pots, and placing them in a hotbed, potting off as soon as they are large enough to move, and growing them under glass till May, shifting the plants into larger pots as they require it. This is

really an excellent plan, gaining nearly a season in point of time. The best plan is to make up a slight hotbed of leaves for the plants after they are potted off, and in April draw off the lights on fine days, covering up again at night, planting out about the middle of May. And now comes the question, How shall we plant? Is it best to

PLANT IN SINGLE ROWS or in beds? And again, if we plant in single rows, how much space shall intervene? The old system of growing Asparagus in beds is yielding to the plan of single independent rows. Some people think this is a new idea borrowed from the French; but it is not so, for some time ago I was looking through an old book on gardening, published at the beginning of the present century, and there I found the single-row system recommended. In field culture or in large gardens I have no doubt in my own mind that it will pay better to have the rows at least 12 feet apart, with other crops in the intervals between. The plants in the rows may be from 15 to 18 inches apart. Under this system the work would be cheaply done, as most of it could be executed with horse labour. I often wonder, in these bad days for agriculture, that some one does not start an Asparagus farm on this system, for during the time of waiting for the crop, which is the chief objection urged against it by the most intelligent farmers, who are looking for something to partially take the place of Wheat, the land would at least be paying expenses. In small gardens single rows of Asparagus might be planted in any suitable situation. On dry porous soils it is best to plant in slight hollows or trenches, as the plants love moisture, and this will at the same time facilitate the earthing up of the crowns to blanch the stems as they arise. Much difference of opinion exists as to whether the blanched or the unblanched Asparagus is best. I like the medium way best—blanch the lower part of the stem, but let the top be 3 inches above ground. With the bed system we may either have the beds 3 feet wide with two rows of plants, or 5 feet wide occupied with three rows. In either case there will be 2 feet alleys dividing them for the purpose of giving free access to gather the produce, etc. Whichever plan is adopted, for the first two years everything must be done to encourage growth. Liquid manure will be of great service, and rich top-dressings should be given in autumn, but of course there must be nothing cut from the bed during those years. In windy places, until the growth becomes strong and self-supporting, a stake and a tie should be given to the strongest stems to prevent the wind wrenching them, as everything depends upon the production of strong growth, and its perfect development and

ripening. Sometimes a stolen crop of some kind of vegetable or salad is taken from the beds the first year; but, if permitted, it should be of the briefest, lightest character, such as Radishes or Lettuces, or a light crop of Cauliflowers, selecting a small early kind like Veitch's Forcing. Some people attach a good deal of importance to salt as a manure for Asparagus, and in some instances, especially on porous soil, it would do good; but in no case should more than half-a-pound to the square yard be given. Plenty of manure there must be, and, as I have already stated, liquid manure is the most valuable of all. This should be given in summer during the time of growth, for that is the time when the next year's heads are being formed; and I may say that

LIQUID MANURE from the farm tank contains all in the way of manurial matter which the plants require. When the third year comes round, if the plants have done well, a few dishes may be had by stealing a head here and there, but there must be no harsh ruthless dealing with the young plants. Many plantations of Asparagus have been hopelessly ruined by being too covetous in the beginning. The young plants die, and unsightly blanks appear in the rows. Nothing in the whole culture of Asparagus requires so much judgment as

CUTTING THE PRODUCE.—No matter how much care and skill have been bestowed upon the raising of the plants and the preparation of the land, if the knife be used recklessly the result will be failure. Until the plants get very strong it is better to take only a head here and there than to cut all, as may be done with impunity in the case of older stronger plants. Many growers, in dealing with established plantations, cut everything which comes up till some specified time which has been found best in that particular latitude. Speaking generally, the time will probably be from the 20th to the end of June. To cut after that time usually weakens the beds too much and leads to the plants dying, and this is the chief cause of blanks arising in the beds, which occasion so much annoyance, and are so troublesome to fill quickly and well afterwards. In thrusting the knife into the ground to cut a head, we must be careful that none of the advancing shoots are injured. This is not an imaginary danger, and that is my reason for mentioning it.

VARIETIES.—There are several varieties in the catalogues of the best houses, but it is questionable if all are distinct. There are certainly two—the purple and the green—and I do not think there is much to choose between them. Probably if we obtain a packet of seeds and sow them we shall obtain both varieties from that packet. I do not say that it is not possible to purchase them, and really have them separate. I can only say that I have gene-

rally had them mixed. There is a variety called the Colossal, but I am doubtful if it is really distinct. It is probably only a selection from the old kind. However, at first it seems more vigorous, and on that account is worth growing in order to save time. In saving seeds, select those from the most vigorous stems, gathering them when ripe; and when the pulp which surrounds the seeds is quite soft, wash the seeds from among it, then dry and pack them away in a dry cool place till they are required. Asparagus seeds will keep good for several years—I do not know exactly how many, but I have sown them and obtained a good crop of plants when four years old.

VALUE OF SPRING SHELTER.—The early Asparagus is often injured by cold frosty weather in spring, and any shelter which will break the force and take away the bleakness of the east wind in April, and oftentimes in May, will be of real benefit to the young heads of Asparagus just pushing out. The best shelters are movable glass frames, and with a number of these Asparagus may be cut very much earlier from the open-air bed than is generally the case. They should be placed on the beds in the beginning of February, after they can be spared from the autumn and winter salads, and they will come in for hardening young bedding stuff when the Asparagus beds do not require their shelter. If glazed frames are not available, dry sprays of Bracken scattered over the beds will be very useful. Branches of Hazel, such as are commonly used for Pea sticks, laid over the beds afford a good deal of shelter, and may, in cold situations, be profitably employed without any change of their original condition.

CHAPTER V

Seakale.—I am afraid some of my readers may think I am rather erratic in my movements, as I am not taking up the different subjects in the usual alphabetical, or, indeed, any kind of order or system. I am thinking only of their importance to the consumer, and in the case of the plant under consideration I am anxious to remove some of the apathy and neglect which are shown towards it. There are hundreds of people who have never tasted Seakale, and do not know what a delicious vegetable it is in the winter, when things are snowed up, or when one languishes under a daily dose of Cabbage or Brussels Sprouts. It is a British plant, and grows wild on the south-western coast, and ought certainly to be found in every middle-class garden.

PREPARING THE LAND.—There is no plant that will pay better

for thorough deep culture; especially is this necessary when it is blanched on the land where it grows. Though I do not consider this is the best system generally, yet there may be circumstances which render this course advisable, and at the present time it is commonly done, especially with late crops. In the latter case, where no forcing is necessary—only some covering to keep the light and air away—the same objections could not be urged. But where roots can be grown strong enough to force in one season it seems a folly to be burdened with permanent plantations. The best time to plant Seakale is in the spring, say about March, and by that time the land should be in the best possible condition. In years gone by it was a common plan to save the roots which had been forced in the Mushroom-house or elsewhere, plant them out again for the summer, and lift and force again in the autumn or winter. The plants went through this process till in course of time they became exhausted or died, and as the strong ones developed several crowns they were divided to increase stock. If the land is deep and rich, very good Seakale can be grown in this way, but it is hardly systematic enough to suit modern ideas.

PROPAGATION.—Like Horse-radish, there is no difficulty in its propagation, for every bit of root will grow. When the plants are lifted in autumn for forcing, the long roots are shortened, and the thongs cut away make excellent sets. The usual way is to take up the whole stock of roots intended for forcing, trim off the long roots, and lay the plants in some sheltered border thickly, where they can be removed for forcing when required, no matter what the weather may be. At the approach of frost some litter should be placed over them. The small roots which were taken off may be laid in a heap with some sand strewn among them till spring, say about the end of March or beginning of April, when most of them will have developed buds which should be cut into sets, 4 inches or so long, so that a bud remains to grow into the future crown. Plant with a dibble in rows 18 inches apart, and 15 inches between the sets. In planting, leave the bud just on a level with the surface. Cuttings without any visible buds may be planted, and will be sure to grow, for Seakale is a difficult thing to destroy in ordinary culture. The only care needed in summer is to keep down weeds by frequent surface-stirring, and pinch off all attempts at flowering by nipping the buds as soon as they can be seen, unless seed is required. Seakale can also be raised from seeds, and grown large enough, under good culture, in one year for forcing. The seeds may be sown in two ways—in boxes under glass in March, and be planted out when large enough, the same distances apart as was given for root cuttings; or in drills 1 inch deep, dropping the seeds

in patches, three or four in a patch, the latter to be 15 inches apart, to be singled out afterwards leaving the strongest. Slugs, snails, and other vermin are fond of young Seakale plants when they first emerge from the soil; and if the time is difficult for young seedlings they will require watching, or a good many will be destroyed. Dusting with fresh lime and surface-stirring will be beneficial. It is very important to neglect nothing that conduces to rapid growth if we wish to raise plants strong enough to force in one season. If the weather about June should be hot and dry, 2 or 3 inches of manure scattered between the rows will give size and strength to the crowns, and repay for time and trouble. On porous soils a dressing of salt at the same time will be a great help, especially in districts far removed from the sea. The dressing need not be a heavy one, but half-a-pound to the square yard will not be excessive if equally distributed.

PERMANENT BEDS.—The old-fashioned way of growing Seakale was to plant in beds, two rows of plants on each bed, with 3 feet alleys between. The rows, instead of being confined to single plants in a direct line, would be in detached groups, three plants in a group, occupying about as much space as the pots will cover when the plants are forced. The patches should be about 18 inches apart, and when the blanching pots are on the intervening spaces will be filled with leaves and manure. Even when the forcing is done in pits and houses, there should always remain a bed to be blanched without any forcing or fermentation.

BLANCHING.—The blanching of Seakale can be done in various ways, but the exclusion of light is a *sine qua non* whatever plan is adopted. The materials employed should be sweet, and not likely to impart a bad flavour to the Seakale. For this, tree leaves are as good as anything else when not much decayed, with some straw or long litter placed over them to keep them from blowing about. Old tan and ashes, or a mixture of the two, will do very well laid in a ridge 15 inches deep over the crowns. Burnt clay or earth is sometimes used when easily obtained, and answers the purpose admirably.

FORCING.—Its adaptability for forcing forms its most valuable feature, as the green tops are not generally used, although the young green sprouts in spring may be used as greens. As soon as the leaves part readily from the crowns, towards the end of November, forcing may begin. There is no plant which submits so readily to varying conditions in the manner of forcing, provided there is a temperature of 60° in a perfectly dark place, and the necessary amount of humidity in the atmosphere. Seakale may be forced anywhere. I know a garden where the flue from the

boiler-house is taken some distance under ground to a more convenient place to get rid of the nuisance arising from the smoke, as it is in a district where coals are cheap, from the proximity of the pits, and so coals alone are used for the boilers. At the end nearest the house there is generally a nice steady warmth, and in a bed over the flue, Seakale, Rhubarb, and other things are forced in great abundance and at a nominal cost. Good Seakale can also be forced in the Mushroom-house—in fact, this is a very common way of forcing it. The roots are taken up and planted 2 inches apart in batches, as they are required, about every ten days or so. Both the soil in which the roots are planted, and also the atmosphere, should be healthily moist, or the Kale may be tough and lacking in flavour. If grown under the influence of rank manure it will acquire a bad flavour and be unfit for use. It is rather remarkable how forced produce, such as Seakale and Rhubarb, absorbs the strong, rank manurial gases which are in the atmosphere, and retains the earthy taste even after cooking; hence the necessity in forcing this plant for keeping everything in connection therewith sweet and clean. Seakale may be forced in pots under the stage of the greenhouse—half-a-dozen roots in a 10-inch pot, with another 10-inch pot inverted over it. A group of half-a-dozen pots covered with a double thickness of mats will furnish several dishes, and as often as the produce is cut, fresh roots may be planted. When the shoot from the main crown has been cut, if the roots are not required to plant again, they may be left to run themselves out; other shoots—smaller, but of pearly whiteness and of excellent flavour—will spring up, which may be cut when about 6 inches long. There are several modifications of this movable plan of forcing Seakale. A large wine-case, such as the French pack their champagne in for exportation to this country, is an excellent contrivance for forcing Seakale. The roots are packed in earth in the bottom, the lid is placed on, and the box is placed under the stage, or in some corner in a warm house. Some people think that Seakale is better flavoured when forced with fermenting materials; but when this is so, it arises through lack of geniality in the atmosphere, and no matter where the Seakale is forced this should be supplied. I grant, of course, that excellent Seakale has been grown with fermenting materials alone, chiefly leaves. I remember a good many years ago, when I was gardening at a large place in the North of Ireland—Hillsboro' Castle, County Down—that all our Seakale was forced in that way: the leaves were carted on the ground, and the Seakale beds were a scene of immense litter and disorder. When Seakale is forced in this way it should, if possible, occupy a position out-

side the garden and convenient for bringing in the manure and leaves. Manure alone will not do without a good deal of turning and intermixing ; there should be at least an equal part of leaves, or it will be better if two-thirds of the bulk are leaves, especially if the manure is fresh from the stable. When manure is used without any admixture of leaves the heat is too fiery at first, and when the first heat has passed, which it does rapidly, there is no means of resuscitation except by re-making the bed and adding fresh manure. As forcing with manure alone is usually so unsatisfactory, I do not recommend it ; and it generally imparts a bad flavour to the Kale. Seakale may be forced with the aid of fermenting materials, by those who like that plan best, in an ordinary hotbed, by lifting the roots in December, planting in a frame placed on a bed of fermenting materials, and matting up the lights to keep them dark, or wooden shutters may be used instead of glass. The roots may be lifted and planted in a bed or heap of soil in the Melon ground or on any convenient place, be surrounded with boards temporarily placed, have other boards placed on the top, a good thick lining of leaves and manure round the sides, and a lesser thickness on the top. In short, there is no end to the combinations which may be resorted to for the production of forced Seakale ; and the person who cannot adopt one of the plans suggested, or modify them to suit his own case, must be a dullard indeed. There is no reason why Seakale should not be plentiful in every middle-class garden in the kingdom. The roots should be grown in an open sunny situation, to ensure well-grown and well-ripened crowns, and the latter is quite as important a matter as the former. When the leaves of fruit trees seem to cling lingeringly to the trees we think it an evidence of unripe wood, and we would rather see them part easily and readily when the season's work was done. So it is with Seakale or any other plant grown for forcing. When the leaves ripen off all together, the roots will start quickly and the crowns spring up strongly and in good time.

AS REGARDS DISEASES, Seakale may be said to have none. Slugs and their kindred will eat off the young plants in spring, but they yield to the usual modes of attack. The Turnip beetle and its kindred are sometimes troublesome when the seedling plants first emerge from the soil, but dustings of fresh lime and surface stirring will quickly dislodge them.

CHAPTER VI

The Artichoke (Globe).—The question might be asked, Why should rich people have all the best and most delicately-flavoured fruits and vegetables, whilst the middle and lower classes content themselves with the Potato and Cabbage? It seems to me that no satisfactory answer can be given. To say that there is want of enterprise and intelligence does not answer the question satisfactorily. I grant, of course, that it takes time and determination to acquire a taste for anything we have not been accustomed to; but many vegetables, such as Tomatoes, Asparagus, Spinach, etc., are slowly but surely finding their way among the masses, and the more variety in our food-supply the better. At any rate, the supply of wholesome vegetables in our home gardens cannot be too large.

PREPARATION OF THE GROUND.—The better and deeper the cultivation the larger and more succulent the flower heads, which are the only part eaten; and as the crop in the system of culture I am about to recommend will occupy the land four years, the preparations should include trenching at least 2 feet or more in depth if the land will bear it. A liberal supply of manure should also be given, and the surface left in a rough state till the end of March or beginning of April, this being the best time to plant. They should occupy an open sunny situation, away from trees and buildings, and the heads should be cut for use when about half grown. Many people are disappointed with this vegetable because the heads are served up when too old and without their delicate flavour and succulency.

PROPAGATION.—There are two methods of doing this—viz. by seeds and offsets, the latter being the best, as seeds cannot be relied upon to come always true. The value of the heads is much enhanced if the scales which enclose them are thick and fleshy. I have raised a good many seedlings in my time, and have always found a proportion of them to give inferior heads; therefore, as seedlings are required to be grown and selected before their character can be considered fixed, I give a preference in making new plantations to offsets taken from a good variety. The best variety has large robust heads, with the scales broad and tinged with purple. If seeds are used—and sometimes, after a very severe winter, it has been found necessary to raise seedlings because of the losses sustained by frost—when the plants begin to bear, all the inferior varieties should be pulled up. If seeds are sown early

in spring—say in February, in pots, in heat—the seedlings potted off when large enough to handle, afterwards shifted into larger pots, and planted out early in May, all the strongest will bear flower heads in autumn. To accomplish this, they must have good culture. The same thing will occur if we plant strong offsets in April taken from old-established plants in the open ground. To obtain early heads, sometimes a strong plant or two is lifted in autumn, and placed in a cool house, to which a little warmth is given in February, which causes an early start to the flowering stems. The

BEST TIME TO PLANT, in most places, is in April, as by that time all frosts of a severe character will have passed away. In taking off the offsets, dig a trench round the plants to expose the base, and show the best place to cut. In making the severance have a good piece of the old root stem and ball with the young plant, bearing in mind that the stronger the plant, and the less check given, the sooner it will recover and start away on its own independent existence. Plant in rows 4 feet apart, and at 3 feet intervals in the rows, press the soil firmly about the roots of the plants, immediately afterwards mulch with manure, and water in dry weather till they become established. The duration of the plantation should not in a general way exceed four years, and it is best to plant a row or two every year, so as to have the plants of different ages and degrees of strength, as this has an effect upon the period and continuity of their bearing. Except among the best cultivators, it has been too much the custom to regard this crop as a permanent one, which has destroyed its successional character. With old plantations the tendency is to produce all their crop at once, then go to rest and remain dormant. Fairly frequent transplantation upsets this rest-and-be-thankful condition, and leads to incessant activity and a perpetual bearing habit. Something may be done to make old plants bear later, and to prevent them all rushing in together before the half can be used. If in the spring, when the flower stems first start away, the half or more of them are cut out, a second growth will, if the plants possess the necessary vigour and are well fed, spring up, and come in later. But the best way of securing a succession is frequently to transplant in the way I have suggested—planting good-sized pieces, not little suckers.

SUMMER MANAGEMENT.—This Artichoke has a large breadth of foliage, and requires a good deal of support. If not well fed the flower-heads lack substance, and become hard and tough. In cutting the produce never allow any to get too old for use, as this is doubly wasteful. I have occasionally entered a kitchen garden

and seen the Globe Artichokes in flower. They have a very ornamental appearance, but flowering has a ruinous effect upon productiveness. Begin to cut the heads as soon as they are half grown, and do not allow any to get beyond that stage. It is better to cut the heads and cast them on the rubbish heap than leave them to get old; and as fast as they are cut remove the stems which bore them. If liquid manure is plentiful a good soaking will be beneficial any time during the period of bearing. Mulching also with manure will be a great help.

PROTECTING IN WINTER.—Though for the most part the Globe Artichokes are fairly hardy in a well-drained soil, they should not be left to pass through a severe winter unprotected, for if they survive they will probably be so much weakened as to be of little use for bearing purposes the following year. From 1861 there were twelve or fourteen years without a frost sufficiently sharp to injure them; but of course sharp winters are sure to visit us occasionally without giving notice of their coming, and it is safest and best to be prepared for a low temperature. The old way was to cover up the rows of Artichokes with long dry litter, and then raise a bank of earth over the plants, which remained in this condition till the growth commenced in spring. I do not think that all this trouble and care are necessary, but it is a good plan to pack some burnt earth or ashes 6 or 8 inches thick round the base of the plants, extending a few inches outside them all round. This should be done early in winter, and when frost sets in cover the plants over with litter, and leave it on as long as frost continues. All the plants should be uncovered by the end of March, and the ashes, burnt earth, old tan, or whatever has been used to protect the base of the plants, should be levelled down between the rows, and forked in with a dressing of manure. When the plants are crowded with growth in spring, the weakest offsets should be removed.

VARIETIES.—I have two varieties here, the green and purple-tinted—the latter, in my opinion, being by far the best. I have seen a good deal of variety in seedlings—proving, if proof were needed, that the best form of the cultivated Artichoke has been evolved by a long course of culture from an inferior kind, and that seedlings—at least some of them—display a tendency to return to their former condition, showing that some of the old wild nature still remains with them.

Cardoons.—Botanically the Cardoon is nearly related to the Globe Artichoke, and in the early stages of their growth the two plants resemble each other; but beyond this all resemblance ends, as in culture and use they are diametrically opposite. The

Cardoon, like the Celery, is a biennial, raised from seeds annually ; but though, as regards the production of flowers and seeds, its habit is biennial, as a vegetable it really is an annual, and the seeds must be sown every spring. Trenches are prepared as if for Celery about the middle of May, and about the same distances apart. In the bottom of the trenches should be placed 6 inches of thoroughly decayed manure mixed with earthy compost, in which some charred rubbish or wood ashes form a part. This is mixed and blended with the soil at the bottom of the trench in such a manner as to leave a good tilth on the surface to receive the seeds. If it does not do this, some fine compost or surface-soil must be added to give them a chance of growing unchecked. When the trenches are ready draw a drill along the bottom 1 inch deep, sowing the seeds thinly ; and when the young plants appear, thin out to 15 inches apart, leaving, of course, the strongest to form the crop. After this the same culture as is commonly given to Celery will suffice, the main points being a good supply of water, and earthing-up to blanch when the plants are strong enough. To obtain a succession several sowings are made, the first taking place in heat towards the end of March ; the seeds are sown in small pots, four or five seeds in each, and, if all germinate, should be reduced to one, leaving, of course, the strongest. The success of this first crop will be in proportion to the attention it receives. If the plants can be carried through without experiencing any serious check, all will be well ; but if checked or starved in any way the plants will bolt. The early-raised plants should be hardened off and planted in the trenches in May. The first week in June is perhaps the best season to sow the main winter supply, and it should be sown in the trenches in patches from 15 to 18 inches apart, reducing the plants to one in each patch when they are large enough, keeping them well supplied with water to ensure rapid growth, and mulching over the roots with manure.

EARTHING-UP.—This should not be done till growth is nearly completed, or at least till very considerable progress has been made, as it certainly checks growth, and no water can be given afterwards. As regards the main crop, the earthing-up will be done in October, as early in the month as convenient. Select a dry day for the operation, draw the leaves together carefully, and secure them with matting ; afterwards envelop the plants with hay bands, and then build up the soil over the whole, except a few inches of the points of the leaves at the top. In about five or six weeks the heads will be in a perfect condition for use, and should be lifted a few at a time, as required. Though they are sometimes lifted at the approach of severe weather, and packed in earth in

some easily accessible place, I always think that both these and Celery are crisper and sweeter when lifted fresh from the trench where they are grown, for when that first freshness is once lost it never returns. It is easy enough to keep out frost if the rows are well covered up with dry Fern or litter, which should always remain on till the frost has completely disappeared. Cardoons are not so much grown in this country as they were thirty years ago. It is only where French cookery is understood and appreciated that they are asked for. Some day, doubtless, amid the changes which seem impending, the Cardoon will come to the front again, and be extensively used. There are several varieties, but the best and hardiest has its leaf-stalks armed with sharp spines, and is of robust habit.

The Jerusalem Artichoke.—This root has never been much in favour with the masses. Its peculiar flavour and close waxy texture compare unfavourably with a good dish of floury Potatoes, and hence it is never likely to rank so high in the estimation of the general public as that valuable esculent; still, in middle-class families it furnishes a desirable change, and is well worth growing to a limited extent. It is very prolific, and will succeed in any kind of soil and in every situation. Though it will grow anywhere, it succeeds best in a deep, somewhat light well-drained soil, in an open sunny situation.

SELECTION OF THE SEED.—This Artichoke under ordinary culture has rough uneven tubers, but it is possible by care in selection to modify this roughness. If, when lifting the crop, the smoothest and handsomest medium-sized tubers are placed on one side for planting the following season, one step in advance will be taken; and if this be repeated for several years a sensible improvement will be seen. The planting should take place in March, early in the month. Draw drills 3 feet apart, as for Potatoes, plant the tubers 18 inches apart in the drills, and cover about 3 inches deep. In damp soils plant on the surface, and cover with the hoe, drawing the soil from each side of the rows to form a ridge over the sets. The summer culture only amounts to one or two hoeings early in the season, as after the plants begin to grow they smother all weeds. The frost kills all growth above ground in winter, but does not hurt the tubers, and most people leave them in the ground, digging up a few as required, but laying in a larger stock when severe frost is expected. Sometimes when frost sets in they are covered with litter. Although that is not necessary as a protection, it enables them to be taken up during sharp weather, when the ground would otherwise be frostbound, and the tubers are better flavoured when freshly lifted from the

earth. From their freedom from disease, and heavy cropping qualities, and the very small amount of expense attending their cultivation, they might, where land was plentiful, be grown for stock feeding, as all things about a farm eat them readily, even rabbits and hares being fond both of tops and tubers.

As a SCREEN in summer they are useful to hide any unsightly object, even buildings being hidden in a short time by the rapidly-ascending stems, clothed with broad Sunflower-like leaves; in fact, the plant is a tuberous Sunflower, as may be seen by an examination of its flowers, which are produced freely enough by well-developed plants in a warm summer. When grown as a blind they may be left in the ground till March, then trench the ground over, taking out the largest tubers, but leaving a sufficiency of the remainder to plant the land again. In ordinary culture the crops should be taken up before growth begins—say about the end of February, and all the tubers should be taken out, as every bit will grow if left in the ground. Rotation of crop may not have as much weight with this plant as many others; still it is as well to have a change annually, following the same routine as other crops. This must always be regarded as a background plant; but in no case should it be planted under trees.

CHAPTER VII

Broad Beans.—The first sowing, if made in the open ground, should take place in December or January, when the soil is in suitable condition. Select a warm sheltered situation, draw drills 5 or 6 inches wide and 2 inches deep, plant the Beans in a double row by placing them alternately on each side of the drill 5 inches apart, and cover with the dry soil. Mice are very fond of these beans, and as soon as they are planted set two or three of the common brick traps. A few coal ashes sprinkled along the surface of the soil over the rows generally act as a deterrent. The best way of raising the first early Beans, however, is to sow in January in boxes, and place them in some house or pit where there is a little artificial heat. A temperature of 50° will be ample.

BEANS TRANSPLANT WELL. Early in March, when they have been sufficiently hardened off, they should be planted out in rows in the open ground, sheltering them by drawing up ridges of soil on each side and sticking a few Spruce or Yew tree branches on the windward side. They may be planted either in single or double rows—I confess I like the single rows best. I always find transplanted Beans are more branching in their habit, generally throwing

out side shoots from the bottom, than when they are started at first in the open air. When planted in single rows the distance between them should be 2 feet. If double rows are planted the distance between the rows should be increased to 3 feet, with, in the case of the early sorts, 5 inches between the Beans in the rows. The Windsor Beans planted later should have a little more space. Successional crops should be planted at the beginning and end of March, again in April, and again for late bearing in May. It is not advisable to plant Beans after May. I have sometimes had a fair crop from Beans planted in June; and where late Beans must be had it is as well not to neglect the opportunity of securing them which June planting gives. But where the pods are closely gathered from the March and April plantings, and the stems are cut down to within 6 inches of the ground, a new growth will break out again, which will bear a better crop than later sowings, simply because the early-sown plants have obtained a better grasp of the soil, and are consequently in a better position to resist the heat and drought of August. Plants from which this is expected must not be allowed to expend themselves unduly by carrying their first crop too long, or until the seeds are approaching maturity, as this will take away all vigour or inclination to start a new growth. The object of the plants—viz. to ripen seeds, and so effect their perpetuation—being accomplished there is no inducement to move without some stimulus, which, as a rule, cannot be given to common things like Beans. Where this latter objection does not apply, a good soaking of liquid manure and a mulching will expedite matters amazingly. As the different sowings or plantings advance in growth they should be earthed up, as this supports and shelters them very considerably; and when a sufficient number of blossoms are expanded to form a crop the points of the plants may be nipped out with a sharp hook. Sometimes the black aphid attacks the plants, usually settling on the extreme points; and when this is so, nipping off the tops, if done carefully, will remove them, leaving the plants clean. The prunings must of course be taken away and destroyed. There is hardly a garden in the kingdom where Beans are not grown; therefore I need not say much regarding the character of the soil most suitable for Bean culture, though when there is a choice between light and heavy land it is always best to plant the main crop on the heavy land, as Beans always bear the best crops and produce the tenderest and best-flavoured quality on rather stiff soil.

VARIETIES.—The old Mazagans are losing caste for garden culture, as the Longpods are much better for early planting. The Early Green Longpod is my favourite. Beck's Green Gem is

a dwarf free-bearing kind, well adapted for planting on south borders to come in early. I prefer the Green Windsor for late use to any of the broad forms of the Windsors, the last being, in my estimation, too coarse to send to table, as well as being bad in colour. Those three varieties will satisfy most people who look for quality only, but for exhibition the large-podded kinds must be grown, the best of these being the Seville Longpod and Carter's Mammoth; Hardie's Pedigree and Taylor's Broad Windsor may be grown by those who like large Beans.

Dwarf French Bean.—Though not as a rule so highly esteemed as the Scarlet Runners, this is a most valuable summer vegetable. To have it in the best possible condition plant thinly, and pick all pods as they become fit for use. Thick planting and leaving the pods till they become too old for use stops further production. This Bean is especially valuable for small gardens, because it will grow anywhere, and involves no expense for supports.

The early crop should be planted in a warm sunny position on a south border or at the foot of a south wall about the middle of April. When they come up shelter them with a few low branches, and draw up a ridge of soil on each side as a further shelter. Draw drills 2 inches deep and plant the Beans 6 inches apart in single rows. I have seen these Beans sown in the drills like Peas; but this is a great mistake, as each plant, if it is expected to do its best, should have a separate and independent existence. In no other way can it acquire the necessary strength and vigour to be lastingly productive. The second sowing may be made in the open quarter about the first of May. The early crop should be composed of early varieties, of which there are now a great many kinds, but the Beans are mostly small. The second sowing should be of such kinds as the Negro Longpod, and the main crop, which will follow in succession, being planted at intervals of three weeks or so from the 1st of May till the end of June, should be the Canadian Wonder. This variety I believe to be the best; it bears a long pod, which does not get tough so soon as many sorts do. The extent of the sowings must depend upon the demand. A pint of seed, in the second or third week in April, will plant a good-sized bed. For small gardens probably half a pint will be enough, if planted thinly, for the first crop, as the second, planted in the beginning of May, will follow closely. With this second crop it is a good plan to include one or more of the later kinds; indeed, I generally plant three kinds, which usually form a good succession if rightly selected. Say, for instance, we plant one or more rows of the early Newingtons, or Osborn's Forcing, the same quantity each of the Negro Longpod and Canadian Wonder: we shall then

have a succession coming on in proper order, though all planted at the same time. Now, as regards position for the successive crops, wherever the soil is in good condition this Bean will thrive, if it has room enough to strike out. Treated in this way it is a very different plant from what it is when crowded. The Longpods may be 6 inches apart in the drill, and the Canadian Wonder should have still more space. I attach so much importance to this matter that I cannot help reiterating the importance of

ALLOWING PLENTY OF SPACE, if it is desired that the plants should be productive. I have said that the position of this crop is a matter of no great importance after May comes in ; but an open sunny situation is the best. I have in hot dry seasons planted in June under a north wall with success ; but it is an Eastern plant, and delights in sunshine, if rightly treated. I shall refer to the forcing of this Bean under glass in a future chapter on forcing vegetables, and confine my present remarks to open-air culture. In many good gardens, where there are glasshouses and frames, the early crops are frequently sown somewhat thickly in boxes under glass, and transplanted when 2 or 3 inches high, or when the rough leaves appear. This Bean transplants well, and, with care in sheltering when first planted out, the crop is usually a success. The distance between the rows must in some measure depend upon the kind of Bean planted. Two feet will be enough for the early kinds, but 3 feet will not be too much for the robust varieties, such as the Canadian Wonder.

THE LAST SOWING should be made not later than the middle of July ; it should consist of a small early kind, such as the Newington, which must be planted in a warm position on a south border. It may be an advantage to make some provision for giving shelter to this crop in order to prolong the season. There is no difficulty, providing one has the means, in gathering French Beans all the year round, as the autumn crop, if started early enough under glass, will follow closely the protected one on the south border.

WATERING AND MULCHING.—Though undoubtedly water is a great help to this as well as most other crops in a dry and arid time, yet, as there are other plants in the garden which suffer more from drought, it is seldom that French Beans are watered. A mulch of half-decayed manure will in this case be better than watering, and will keep the plants thriving and fresh at a small expense. If the Beans are picked off as fast as they become fit, they will bear continuously for a long time.

VARIETIES.—To the kinds I have already named I would add, for the advantage of those who desire more variety, the

following :—Ne Plus Ultra, Veitch's Improved Longpod, and Fulmer's Forcing.

PRESERVING BEANS FOR WINTER USE.—In summer, when Beans are plentiful, they may be preserved in the following manner :—Dress the Beans as is usual for cooking, place in stone jars, with salt strewn plentifully among them, and keep air-tight till required for use. Before using, soak the Beans in fresh cold water for several hours, changing the water once or twice.

Runner Beans.—For use from the end of June or beginning of July until October, the Runner Beans are more esteemed than the dwarf French species. They are more tender and succulent, do not so soon become old and tough, and bear more continuously. The Scarlet Runners are the prime favourites of the cottage gardener. If there is only a few yards of garden, room is found somewhere for a row of these Beans. Few people, I imagine, save the old roots, which are of a tuberous nature, and if preserved through the winter and planted the first week in May in a warm site will give a few early gatherings, perhaps a week or two earlier than plants raised from seeds would do. But except for this slight advantage seeds are much the best—in fact, I may say that I do not know any one now who saves the roots. A few rows for an early crop, if it should be necessary to gather very early Runner Beans, should be planted on a warm site 3 feet apart, and not staked, but pinched in severely. If the spaces between the rows are mulched with rather long manure the crop will repay for it. Sometimes the plants for the early crop are raised under glass where there is a little artificial heat, and then hardened off and planted out after all danger of frost is over. A good deal of the success of this plan will depend upon the care which is exercised. The Beans should be planted thinly in boxes and placed near the glass, so that the stems of the plants when they emerge from the soil may be robust and hardy, which growth made in the full light under glass never fails to be. They should be moved to a cool place to harden thoroughly before being finally moved to the open air. It is well to plant in shallow trenches, which will leave a ridge of soil on each side to form a shelter. This soil, later on, may be drawn about their stems, and the mulching will keep all comfortably moist. The successional crops may be planted about the middle of May (this, in fact, will be the main crop in most gardens), and again about the first or second week in June. I have never had any difficulty in carrying the June-sown crop in a bearing condition till the frost cuts them off some time in October (taking the average of seasons), and I like the white-seeded Giant variety for the late crops, as it bears very freely, and seems better

adapted for late work than the Scarlet Runner. It is best, where it can be done, to isolate the rows, or at least let them have plenty of space, so that the light may fall fully on them. In no case should there be less than 6 feet of space between the rows, and if very tall stakes are used this distance should be increased. We always save the largest and strongest from the bundles of Pea-sticks, when they are dressed in winter, for the Runner Beans. These, when placed to the Beans, and their tops trimmed and levelled, are about 6 feet high, and with this height of stick 6 feet spaces should be left between the rows. The best way to plant the Beans is to draw drills 3 inches deep, the same as for Peas, and 6 inches wide, and plant a double row, the individual seeds to be 5 inches apart in the rows. As soon as the plants have formed the first pair of leaves draw some soil up to the stems from each side, and place the sticks to them, so that the twining shoots may find supports the moment they need them. Then, as the leading shoots reach the top of the sticks, pinch the points out to strengthen the growth below, and keep it within bounds. In hot dry weather the blossoms sometimes drop instead of setting. A soaking of water and a few inches of mulch will correct this, and the latter is a great support during summer. This attention, especially if the situation is open and sunny, will be a great help. In dry porous soils the main crop may with advantage be planted in trenches or hollows, and the soil beneath should be well manured and broken up. These stations should be prepared early in spring, so that the soil may have time to become adjusted or partially consolidated. In shallow soils the trench system does not answer so well; but by sowing on the surface in the ordinary way, and drawing up a ridge of soil on each side, the benefit of a trench may be secured without reducing the depth of soil available for the roots. Runner Beans are often used as a blind, and a very excellent and profitable summer blind they make. They will run up string stretched on the face of a wall, or may be made to cover an arch spanning a walk. The pods should be gathered as soon as large enough for use. If allowed to form Beans, the strength of the plants is too much reduced for continuous bearing. When seeds are required it is better to plant a row for the purpose, as those ripened in the summer-time are better calculated to transmit the strength and vigour of the plants than the late Beans after the plants have become exhausted. The same remark applies also to the dwarf French and all other Beans.

VARIETIES.—The old Scarlet Runner is very generally grown. Carter's Champion and Girtford Giant are improved varieties, obtained by selection. The Giant White is an excellent kind for

late planting. I grew a running form of the dwarf French Bean called Premier a few years ago; it grew about 5 feet high, and was very productive. I have tried to obtain it from several seed-houses since, but without success. I look upon it as a desirable Bean to grow, and hope that it is not lost.

CHAPTER VIII

The Cauliflower.—This is a summer and autumn vegetable, and at that season fills the position occupied by the Broccoli in winter and spring. The most valuable crops are the early ones in spring and the late productions of autumn. In summer they are frequently unsatisfactory during hot weather, and, at any rate when Peas and French Beans are plentiful, they are not so much in demand.

The first sowing is in a general way made about the 25th of August, the time being varied according to latitude, as experience may direct. In some places the first week in September may be early enough. Select an open situation where the land is in good condition from a previous manuring. If the weather is hot and the land very dry, stir the surface for a foot or so in depth with the fork, and give water enough to moisten it. Draw drills 9 inches apart, and sow the seeds (which should have been obtained from a good source) thinly. Cover with nets to keep off birds; and if the weather continues hot shade a little by laying a few branches with the leaves attached over the net. It may not be necessary in any but extreme cases to adopt this treatment; but in dry autumns a little extra trouble will hasten the germination of the seed and add to the strength of the plants. As soon as they are up and large enough to move safely (which will be early in November), prepare one or more frames by placing a layer of coal-ashes in the bottom; and on the ashes, which should be beaten down firmly with the back of the spade, place 5 inches of light rich soil. Into the bed so formed dibble the plants 3 inches apart, and give water to settle the soil round them. During the winter the frames should be fully ventilated when the weather is mild, keeping out cold rains. In times of severe frost scatter a little dry litter or Fern over the lights. Sometimes Cauliflower plants pass through the winter safely pricked out at the foot of a south wall, or on the south side of a thick hedge, sheltered in severe weather by placing evergreen branches among them. Another way of raising early plants, and an excellent one (I can speak from experience, having practised it for many years), is to sow in heat about the first of January, and treat the plants as we should tender

annuals. I wrote this on the last day of 1883, having just made my usual sowing of Cauliflowers. The sorts are Veitch's Early Forcing, Early London, Walcheren, and Autumn Giant. The seeds are sown in pans covered lightly with sandy soil, and placed on a shelf in a house where the temperature is about 60° at night. When the young plants appear they will occupy a position in the full light near the glass, and when large enough will be pricked off into 60-sized pots, one plant in each pot. The soil and pots will be taken into the house to be heated a little before potting takes place. The plants are grown on in the same temperature till March, when they will be well established; they should then be hardened off, and planted out early in April. This plan will not give more trouble than is taken every spring with the same number of bedding plants, and they do not bolt as sometimes happens with those raised in August. Still another way of raising the first early Cauliflower plants may be described as intermediate between the cool treatment first mentioned and the warm plan last described. About the middle of October sow the seeds in boxes and place in a frame which rests on, say, an exhausted Melon or Cucumber bed, and still retains a little of the summer's warmth. Keep close till the seeds germinate, then give air freely, and when the plants are large enough pot off singly in small pots. Winter on a shelf in the lightest part of the greenhouse.

PLANTING UNDER HANDLIGHTS.—These are old-fashioned but very excellent contrivances, of which I suppose no one has too many. About March—acting, as all must, according to the character of the weather—arrange the lights for the early crop in a warm, sunny, sheltered position, where the soil is deep and rich, 3 feet apart each way, and plant four plants under each light. As the season advances ventilation will be required, either by placing the lights on bricks, or, if the lights have movable tops, by altering their position. A few early Cauliflowers may generally be obtained by planting in front of a south wall, almost close to it, to take advantage of the sun's warmth, which accumulates there both on the soil and in the air. Such plants may be further assisted by a ridge of soil in front; and when the weather gets warm later in the season this ridge will help to confine the soakings of liquid manure which good cultivators will obtain by hook or by crook for their early Cauliflowers.

SUCCESSIONAL SOWINGS should be made in March in heat. A few seeds may be sown among any other young crops, such as early Horn Carrots, as the Cauliflowers will be transplanted before any harm can be done. If it is not convenient to do this, sow the seed in a box, and place it where there is some artificial warmth,

harden off, and plant out as seems necessary. The Autumn Giant should be sown at this time for late summer and autumn use. This is a very valuable Cauliflower for hot seasons. It is very difficult with any other sort to secure close firm hearts in August and September; but the cross of the Broccoli, which is so apparent, and gives this kind its hardiness, almost makes it heat and drought proof—hence its great value, not only in the late autumn, but also through the season from August till Christmas. Sow the Walcheren in April, and again in May and June for autumn. This, with the Autumn Giant, will furnish a supply till the winter Broccoli turn in. In difficult situations Cauliflowers are very uncertain; they must have plenty of rich manure. In an emergency, to get them good I have opened a trench 4 feet wide all across a quarter, worked in plenty of manure, then drawn three drills at equal distances apart in the trench, and sown seeds of the Walcheren thinly. If it is necessary

To SOW IN TRENCHES, this is a better plan than having single rows, as the better soil and manure, being in bulk, retain the moisture longer, and the plants do better. When the seedlings are strong enough to transplant, single them out, leaving the strongest; and for this crop they may with advantage be left much thicker than we should plant them generally. In hot weather small white close hearts are more useful than large ones, which nearly always develop a tendency to open. Some of the plants thinned out may be useful if planted under a north wall in rather deep drills. This is acting on the principle of never throwing a chance away. The crop in the trench had better be started about the first or second week in June. If well attended to, and grown without a severe check, it will be sure to produce nice useful hearts at a very small expense. It is worth something to feel that, under all circumstances, we may rely upon any particular crop turning out right.

WATERING AND MULCHING.—Mulching with manure in hot summers is invaluable to this crop, and, except in extreme cases, will obviate the necessity for much watering, though, of course, a good soaking of liquid manure in a dry season will never come amiss. The three sowings in the open air in April, May, and June, with the previous sowings under glass, will, if planted out in the usual order when the plants are large enough, furnish a supply from June till Christmas, if need be; indeed I have had both Walcheren and Autumn Giant till after Christmas in good condition in a cold pit. The distances between the rows, as well as those between the plants in the rows, will vary according to the situations and seasons, but 2 feet between the rows,

and 18 inches separating the plants from each other in the rows, may be taken as a good average distance.

VARIETIES.—The following are good :—Veitch's Early Forcing, Dean's Snowball, Early London, Walcheren, and the Autumn Giant. It is hardly necessary for a private grower to save seed, but it is very desirable to obtain it from a good firm.

CHAPTER IX

The Cabbage.—Though Cabbages may be said to be always in season, the most important crop is the early one. The earlier Cabbages can be obtained in spring the more are they appreciated.

SOWING THE EARLY CROP is therefore an important matter, and usually takes place from the 20th of July to the 5th of August, according to the latitude and climate of the place, and the character of the season. In the extreme south, the first week in August will be early enough, and in the north a few days before the 20th of July may not be too early. Some allowance should be made for particular varieties. Large kinds, such as the Enfield Market, which are not so liable to bolt prematurely, may be sown ten days before the Early York section. The seedbed may be prepared on the border from which the early Potatoes were lifted without any preparation beyond a dressing of soot and lime lightly forked in, and a soaking of liquid manure if it can be obtained. In the course of a few hours after watering, when the moisture has had time to penetrate the whole mass, the ground should be raked level, and the drills drawn 9 inches apart and 1 inch deep. In dry hot weather I like to prepare and water the seedbed in the evening, leave it all night to tone down, and prepare the bed and sow the seeds early in the morning. The seeds should not be sown too thickly, as the number of plants required in any garden will not take much space if treated rationally. It is certain that in raising plants for transplanting, especially of this family, very much seed is wasted. This, perhaps, would not matter so much if the mischief ended there; but very thick seeding leads to debility in the progeny, and although some people may think that in the matter of a Cabbage this is not of much consequence, yet in the case of some sections of the family—Brussels Sprouts especially—the plants in all stages of their growth should have justice done them. Protect the seedbeds with nets as soon as they are sown, to keep off birds; or the seeds may be dressed with red-lead and made distasteful to seed-eating birds.

TRANSPLANTING.—This may take place any time after the

plants are large enough—the end of September or early in October is a good time to plant the main crop. In many gardens the Cabbages follow the Onions. The land is generally well manured and deeply worked for Onions. As they are not an exhausting crop, a top-dressing of soot, and, perhaps, a little phosphate or some other artificial manure, hoed in deeply, will suffice; at least this is my own practice. I have not planted Cabbages in autumn on newly-dug land for the last sixteen years, and I very seldom lose a plant, no matter how severe the winter may be. The plants heart more speedily on rather firm land if it is in good condition, and a week in point of earliness is sometimes thought much of. The large sorts of Cabbage should be planted in rows 2 feet apart, and 18 inches from plant to plant in the row. The small kinds, such as Atkins's Matchless and Cocoa Nut, may have the rows 6 inches nearer. On the early border, where the land is valuable, I generally plant a piece of the small early kinds 1 foot apart each way. In a general way I think a good deal of land is wasted over Cabbages. Very few people really care for large Cabbages, and the small-hearted kinds may be twice as numerous on the ground. During autumn and the time of growth generally the surface should be stirred occasionally for the purpose of checking weeds and keeping the surface loose; and early in the season some earth should be drawn up to the plants on each side.

Placing a string of matting rather loosely round the plant, but yet drawing the leaves in towards the centre, helps them on a little when they are turning in.

TAKING A SECOND CROP.—In private gardens this is generally done, except in the case of the few plants on the early border, which are planted too thickly to stand through the summer. The main crop, as fast as the hearts are cut, or at least when the buds in the axils of the leaves are showing signs of growth, should have the leaves remaining on the stems cut off close up to the bursting buds, and in a very short time these latter will develop into very nice little Cabbages, some two, three, or four, as the case may be, on each stem. A mulching of anything that has any manurial value will help the second crop immensely, and prevent the land from being unduly exhausted. As Cabbages treated on this principle occupy the land some fifteen or sixteen months at least, any help which can be conveniently given is of great benefit.

SOWING IN SPRING.—Cabbages are very accommodating, and may be sown in heat any time during winter or the early spring, if such a course should be necessary. I remember that in the very severe winter of 1861 the Cabbage plants in many parts of the country suffered much. The autumn crops in many places perished,

and the plants raised in heat then were useful. As a rule, of course it is not necessary to sow Cabbages in heat at all; and I only mention it to show that all the Brassica family are amenable to this, if such a course, under any exceptional circumstances, should be necessary. Many people, when they plant out the autumn or main crop, either leave the small plants to stand on the seedbed till spring, or transplant them thickly in a nursery-bed, where they will remain through the winter. There should always be a reserve of plants somewhere. In March all plants remaining after vacancies are filled up should be planted out to give a supply of young Cabbages when the main crop has been cut, and before the second one on the stems is fit for use. Seeds of Enfield Market or Cocoa Nut, sown in March or April, will be fit to cut in autumn.

SAVING SEEDS.—Many people save their own Cabbage seeds, as they pride themselves on having a better variety than their neighbours, and wish to perpetuate it. The plants selected for seed-bearing should be true to the type. When the Cabbages are cut the stems may be lifted carefully and planted in a group by themselves, and some fine netting may be spread over the blossoms to keep away insects bearing foreign pollen when the plants are in blossom. This care is especially necessary if any other member of the Brassica family should be growing near and in blossom.

VARIETIES.—These are now very numerous, but four or five are sufficient to keep up a good succession, and no one need grow more. Atkins's Matchless, Cocoa Nut, Heartwell, Enfield Market, and Wheeler's Imperial are good varieties. Red Dutch should be grown for pickling, also the London or Rosette Colewort, which are used in a young state in winter. The seeds of the Coleworts should be sown in June and planted out on vacant land anywhere, without any special preparation beyond a deep hoeing and a dressing of soot. Draw drills 1 foot apart in August, or when the plants are ready to go out, and plant 9 inches apart in the rows. These are often thought more of in winter than the second crop of Cabbages, being young and tender. They are looked upon as a catch crop, being cleared off in time to give the land the usual winter trenching, in preparation for the roots in spring. They may succeed early Peas, Beans, and autumn-sown Onions, or be planted wherever a vacancy exists, no matter how small. Their capacity to fill usefully any small patch adds to their value.

RED CABBAGES.—It is not advisable to sow these too early. In the Midlands, it is early enough to sow at the beginning of August, and I have had very good Cabbages from plants raised early in March. Many housekeepers defer pickling till the autumn

frosts occur, under the impression that the low temperature has a ripening effect upon the Cabbages, and colours and improves the keeping of the pickle. The cultural details are the same as for other Cabbages, and nothing further need be said about them.

CHOU DE BURGHLEY, OR CABBAGE BROCCOLI.—This hybrid, raised by Mr. Gilbert, of Burghley Gardens, has now pretty well satisfied the critics, and may be recommended as a first-rate winter green, nearly as hardy as the Brussels Sprouts, and noticeable for its extreme delicacy of flavour. The seeds may be sown two or three times during the spring from March till June, and planted out at intervals as vacancies occur, with the same space and treatment as is usually given to Cabbages. Chou de Burghley forms medium-sized hearts, like a sugar-loaf Cabbage, which may be cut and used in that condition, or left till later in the season, when a small white Broccoli has developed in the interior of the heart.

The Savoy.—Everybody is familiar with the handsome crumple-leaved Cabbages which are so hardy and useful in autumn and winter. The seeds for the autumn supply should be sown about the end of March, and the young plants transplanted as soon as large enough. A further sowing should be made about the end of April. By planting the earliest and strongest plants out first, and leaving the smaller ones to stand longer, a successional character may be obtained from one sowing. If the small plants which are left to the last are dibbled in any vacant plot, 9 inches apart, very nice little hearts will be secured, and thus any waste can be avoided. I have seen many nice dishes of delicate little hearts cut from what appeared to be the refuse of the seedbed. Where bulk of crop is required the Drumhead is the kind chosen, but these large-hearted Cabbages have fallen into disrepute since the race of small-hearted delicately-flavoured varieties, such as Tom Thumb and King Coffee, were introduced. It is found that the small varieties may be planted so much closer together that the loss even in bulk of crop is not, after all, so very great. The Drumhead will require as much space as the Enfield Market Cabbage—2 feet between the rows—and the plants should stand 18 inches apart in the rows. The small kinds, such as Tom Thumb, do not require more than half that space.

CHAPTER X

The Broccoli.—In the winter and spring the Broccoli occupies the place filled by the Cauliflower in summer and autumn. Both, from climatical conditions, sometimes fail wholly or partially ;

the Cauliflower, from heat and drought in summer, open their hearts and become useless, and the Broccoli is occasionally killed during severe winters. But these, or somewhat similar risks, have to be run with all things. The varieties, or at least names, in the seedsmen's lists have become exceedingly numerous, and are very perplexing to the uninitiated ; but no one, even for a large establishment, need grow more than six or eight kinds, and if rightly selected these will give a succession from November till June (subject of course to the weather), and fairly fill in the time between the late and early Cauliflowers.

SOWING THE SEEDS.—In most places the first week in April is time enough to make the first sowing. It is not necessary to make more than one sowing of each variety—the early kinds first and the late sorts three weeks or a month later. It is best to sow in drills a foot apart ; the surface can thus be stirred, and the plants gain strength by the partial isolation. Select for the seedbed a nice mellow piece of land (in an open sunny position) that has been manured and laid up roughly for exposure some time previously. Sow when the surface is dry, and to give firmness tread it once over. Then rake the surface smooth, and draw the drills half an inch deep. Cover with the feet. This is easily done by walking with one foot on each side of the drill, and as each foot is lifted in the onward motion, it is drawn along the ground lightly, so as just to push the loose soil into the drill. This is an excellent and simple way of covering seeds. The rake is then drawn over the beds to make all smooth. As soon as the seeds are fairly committed to the ground the seed-eating birds—sparrows, linnets, and finches—will be after them ; and if they are not protected, or something done to alarm the birds, damage will ensue. They are usually most troublesome just when the young plants are coming up, as then they can seize them by the stem, and pull them out of the ground with the seed clinging to the base. The best preventive is to protect with nets as soon as the seeds are sown. In most gardens fishing-nets are kept in stock for protecting fruit in summer, and can be made to serve a double purpose. If the seeds are dressed with red-lead just before sowing, the birds will not touch them, and the lead does not injure their growing powers. Birds are of a suspicious nature, and may sometimes be scared by straining threads of cotton across the beds at frequent intervals. I have known a dusting of lime just as the seeds were coming up scare the birds away and save the crop ; but in a general way nothing equals the plan of making all secure by covering the beds with nets. Some kinds, such as Carter's Champion, Cattell's Eclipse, and Sutton's Late Queen, may be

sown as late as May, and a successional character can generally be given by planting out at different times and in different positions and situations.

TRANSPLANTING.—This should be done as soon as the plants are large enough; and if the land they are intended to occupy is not ready, transplant thickly in any vacant border temporarily rather than permit them to remain in the seedbed to get leggy. Generally most cultivators contrive to have the early sorts put out in good time from the seedbed without any intermediary shifting, though it will benefit the late sorts, which are expected to stand the winter, if they are transplanted once before being settled finally. Transplanting has a tendency to increase the fibrous roots of a plant, and lends a firmer hardier growth, which is of advantage to a plant not quite hardy. The power to withstand an extra degree or two of frost may constitute the difference between life and death in a crop of Broccoli in our climate; and I contend that the cultivator has the power in his hands to influence growth to this extent at least. Another way of increasing the hardiness of a crop of Broccoli is to plant in firm land.

I have planted Broccoli when the ground was so hard that the ordinary dibble had to be discarded and the holes made with an iron bar, and such plants do exceedingly well. The hole is usually made by one man, another man and a boy following with the plants, filling in the hole with nice mellow surface-soil and watering the plants in. Let the weather be ever so dry, the plants soon get established, and when rain falls they grow away rapidly, making short sturdy leaves and strong well-knit legs. Broccoli, especially the late kinds, are often planted too near each other, under the impression that they afford shelter to one another. This is a mistake; thick planting really operates in the opposite direction. To receive full justice Broccoli should be allowed not less than 3 feet between the rows, and 2 feet from plant to plant. I have often planted large growing kinds 4 feet apart, and then had the leaves meet in the autumn. When planted too near, the bottom leaves are always weakly and poor; frequently they turn yellow and die for want of air, and when the cold weather comes the hearts and stems of the plants are left without the shelter which Nature has provided for them.

INTERCROPPING.—In small gardens, where the most has to be made of every foot of land, the system of planting the Broccoli and other winter greens among the Potatoes is frequently adopted. I have planted a part of our stock in this manner for many years from necessity, and many of my friends do the same thing. If the plants have plenty of room I do not think much sacrifice is

made by doing this. It is in the early Potatoes only that patches of Broccoli are planted. They would not succeed among the large-topped late kinds, and both crops would suffer. In the case of the early Potatoes, the crop would be lifted before the greens required the space. If the rows of early Potatoes are planted about 2 feet apart, the Broccoli should be placed in every alternate row of Potatoes. The distance of 4 feet would, in the case of late kinds, be satisfactory. Just before planting the greens (I have treated Brussels Sprouts and other greens in the same way) the tops of the Potatoes which overhang the trenches where it is intended to plant them are carefully turned back. Sometimes the tops may require a little attention afterwards, but, as a rule, the trouble from this source is not great. When the Potatoes are lifted the Broccoli have all the space, and may be earthed. Some people say that earthing-up vegetables, except for the purpose of blanching, is of no benefit; but it is a support and shelter, lessens the force of the wind in spring, and increases the plant's power of resistance at all times.

WINTERING.—The autumn and winter Broccoli, such as Veitch's Self-protecting and Snow's Winter (both of which are indispensable), must of course have protection, as frost will spoil the advancing hearts. The best way of dealing with these is to lift all the earliest at the approach of frost, remove a few of the bottom leaves to economise space, and plant them thickly in pits. Expensively-constructed places are unnecessary, though, of course, where the first outlay is not grudged, permanency in such buildings is desirable. The next best plan is to lay the plants down thickly in some dry sheltered border, burying the stems up to the leaves in the soil, and in frosty weather cover with mats, straw hurdles, or spruce branches. Sometimes the roots and stems of the plants are embedded in soil in a shed, but I never found this plan had more advantage than laying them down in the open air with the necessary protection. I have tried a good many ways of keeping late Broccoli through the winter, with the view of discovering not only the best way of saving the plants, but the most economical, especially as regards labour and protecting materials; and I have come to the conclusion that there is no better way than heeling them in or laying them down with their heads to the north in October—towards the end of the month in most seasons and localities. The check given in the operation has a beneficial tendency, as a plant whose growth has been built up firmly will pass through a lower temperature unimpaired than when luxuriance has been encouraged. The gross plants do not have the largest or closest hearts. A certain maturing or ripening influence seems

essential to all things, especially when the chief production for which it is grown is the flower or fruit ; and though the check of laying down may, in the case of weakly plants, cause the hearts to be smaller, it is certain that these same weakly plants with soft tissues will perish if left upstanding during severe weather. I believe most people who grow their Broccoli well have no reason to complain of the size of the hearts obtained from heeled-in plants.

SAVING SEEDS.—In a general way, unless we have a very superior kind which cannot be obtained true from a seedsman, it is hardly advisable to save seeds. There is no difficulty about it ; but in order to keep the kind true we must make sure that no intercrossing takes place with any other member of the Brassica family. Sometimes, when anything very choice has to be kept true, the patch of seed-bearing plants is covered with hexagon or some closely-woven netting to keep out the bees, or sulphur is scattered over the flowers, or something else done to make them distasteful to the bees. When the seed pods are showing signs of ripening, they should be cut and laid on a sheet of canvas in an open shed or some airy building, to complete the ripening. The seed may then be thrashed out and put away in a dry place.

VARIETIES.—The list I give below is arranged according to the season of turning in, and will follow in succession in the order given :—Veitch's Self-protecting Autumn, Snow's Winter White, Brimstone or Portsmouth, Frogmore Protecting, Leamington, Carter's Champion, Sutton's Late Queen, and Cattell's Eclipse. The purple sprouting-Broccoli is a very nice vegetable, but there is a prejudice against the colour in most establishments.

Brussels Sprout.—This is one of the hardiest and best of the green winter vegetables. In the severe winter of 1861 the Brussels Sprout was among the few living things left in the garden when the winter passed away, and this reliableness in cold seasons is a very valuable quality. It is important that the seeds should be obtained from a good source, and that the strain should be well selected. It was thought years ago that imported seeds were best, but where proper care is used, home-grown kinds are equally good. Those who have been disappointed with their strains of Brussels Sprouts—and I imagine, from the complaints which have reached me, that there are not a few—should try the Aigburgh Sprouts. This strain was selected and grown near Liverpool, and was distributed by a firm in that city several years ago under the above name. Make two sowings—the first early in March and the second about six weeks later. If an autumn supply of Sprouts is desired, sow a few seeds in a box under glass in the latter end

of February, and as soon as they are large enough prick them out in a sheltered situation out-of-doors. Temporary protection with glass frames, if convenient, will be desirable. Plant out finally in the first week in June, the rows to be 3 feet, and the plants 2 feet apart in the rows. The land for all kitchen-garden crops should be well done. Though I may not on every occasion lay particular stress on the importance of this matter, it should be understood as being implied.

THE SUCCESSIONAL PLANTINGS may take place as land becomes vacant, and if the plants are in danger of becoming too crowded in the seedbed, draw some out and plant 6 inches apart—to be transplanted afterwards when convenient. There is no danger of having too many Brussels Sprouts, especially during a cold winter, and therefore my advice is—Plant all you can find room for. I have seen them do well between the rows of early Potatoes, and, in short, I plant anywhere with the certainty that something useful will come of it. As a catch-crop, even when put out late, they come in useful in spring; and the young shoots, which are thrown off by the stems, when the button-like Sprouts have all been gathered, are tender and succulent. The later plantings will not, of course, need so much room as the early lot, for they will not attain to such a development. There has been a tendency of late years to prefer and extravagantly praise the large-sprouted varieties, but I confess I like the medium-sized Sprouts best. As a rule, in the case of vegetables of all kinds, the very large specimens are often coarse and strong in flavour. In late districts, and for an early autumn crop, a few seeds should be sown in September. I have, however, given up the autumn sowing, not finding it necessary for our wants to continue it. Still there are situations where it may be desirable to practise it, and plants raised in autumn are a long way in front of those raised in March.

SAVING SEEDS.—The seed of the Brussels Sprout is one of the few things I save, and I recommend others to preserve a good strain when they get hold of it. There is no occasion to save seeds more than once in five or six years if they are kept dry. Save only from true well-selected plants.

VARIETIES.—I have already referred to the Aigburgh, and every respectable seed-merchant offers reliable strains; but still there is more deterioration visible in this plant, if great care is not used, than there is in most things. Sutton's Matchless is a good strain. Covent Garden, when true, is also good.

CHAPTER XI

Spinach and its Substitutes.—The Round or Summer Spinach is usually sown in succession every fortnight or three weeks from the middle of March till the middle of July. In dry hot situations, the summer sowings are not of much use; they are generally discontinued, and one or more substitutes introduced. The early sowings should be made in a warm situation. Spinach is often sown as a catch-crop between the rows of early Peas. Sow in drills 1 inch deep, and thin out the young plants to 4 inches apart. In May sow the seeds on the coolest spot in the garden, and thin early, keeping the soil freely and frequently stirred, this being better than watering. In many establishments Spinach is a necessity. Never a week—indeed, scarcely a day—passes without its being asked for by the cook. Hence, if from the nature of the soil and situation the Round Spinach will not succeed, some substitute must be grown to take its place during the hot days of summer. The best one I know of is

THE NEW ZEALAND SPINACH.—When cooked it has just the deep-green colour of the real Spinach, which other substitutes have not. The seeds should, twenty-four hours before sowing, be soaked in lukewarm water. Sow in March in small pots, three or four seeds in each; place the pots in a hotbed, and grow them on steadily after they germinate. If all the seeds grow, remove all plants but one. When the plants are getting strong (they do not, however, grow with very great luxuriance in their youth) remove to a cool frame or pit to harden them off, and when all danger of frost is over plant them out 2 feet apart in the warmest and richest corner of the garden. Once the plants get well established the growth will be rapid, and a bed 5 or 6 yards square will furnish a large supply, for the plant does not seem to suffer much from the loss of leaves, but continues its rapid progress. Neither the weather nor situation can be too hot or dry for it. Another useful substitute I have had in the

SPINACH BEET.—This also is a continuous bearer, one sowing yielding an immense number of leaves, and it shows no disposition to bolt till the proper season comes round the following year. The seeds should be sown thinly in April, in drills 15 inches apart and 1 inch deep. Thin out the young plants to 6 inches when large enough. Picking may begin as soon as the true Spinach fails. It is always best to keep this in reserve, and to use the real Spinach as long as it can be obtained, for, although the Spinach Beet is an

excellent vegetable, well-flavoured and succulent, it lacks the deep-green colour and peculiar flavour of the real Spinach. This Spinach Beet is much used in some districts, with Thyme and Parsley, for stuffing corned beef. Still another substitute for the summer Spinach is found in the GIANT ORACH, or Mountain Spinach, which is sown in spring, and the young leaves and tops gathered as required.

THE WINTER SPINACH should be sown in August, early or late in the month, according to locality and climate. I always sow twice—the first early in August and the last in September. The produce of the first crop is fit to gather in autumn and through the winter. The last sowing is exceedingly valuable in spring, continuing to make a new growth up till June. The prickly-seeded variety is commonly used for winter, but a kind called the Flanders has been much recommended of late years. The winter Spinach—with me at least—succeeds best on land that has been well manured for a previous crop, such as Potatoes. The best plan is to dress the land with soot and lime, hoe it deeply, draw drills 15 inches apart, and sow the seeds thinly. On land so treated the crop does not fail from canker, as sometimes happens when the land has been freshly manured and worked. It is well known to cultivators that some retentive soils are drier and warmer if not deeply worked in autumn, when it is intended to sow a crop immediately, especially if it is liable to canker in a cold retentive soil. As soon as the plants are fairly up thin out to 6 inches apart (or more if very large leaves are desired), and keep the soil between and around them frequently stirred, as this not only keeps down weeds but helps forward growth.

TRANSPLANTING SPINACH, though not common, may, if desired, or if there is a necessity for it, be successfully done. The plants should be moved before they become too large. Lift them with a fork, so that the roots may come away intact. Plant with a dibble, and, if the soil is dry, water well to settle it around them. Only the winter Spinach will succeed when transplanted. The Spinach is dioecious—*i.e.* its male and female flowers are borne on separate plants. Saving seeds is not difficult, but it is hardly necessary, as enough for a large supply may be bought for a small sum. There are several varieties of the Round or Summer Spinach offered, some of which are improvements on the old form.

MERCURY, OR GOOD KING HENRY.—This is a hardy British plant, much grown in the gardens of Lincolnshire, the leaves being gathered and cooked like Spinach, and the young shoots in spring treated like Asparagus. It likes a deep rich soil and top-dressings of manure, with occasional soakings of liquid manure. The plant

may be raised either from seeds or root-sets, but the latter plan is the best, and both seeds and roots are fairly cheap. The spring is the time to sow or plant. The seeds should be sown in drills 15 inches apart, and the young plants thinned, when large enough, to 1 foot apart in the rows. The roots (which may be obtained in Lincolnshire for about 6s. per 100) should be planted firmly about the same distance apart as is given above, and when the plants get strong enough gathering may commence, but not much should be taken from them the first year. The plant is a perennial, and will continue to produce for many years if well-treated. The autumn is the best time to apply top-dressing. In spring the young shoots should be gathered like *Asparagus* just beneath the surface of the subsoil, and the leaves may be used as a substitute for *Spinach* whenever they can be obtained.

Borecole or Kale.—These are less grown than they used to be, but they are mild in flavour and tender in composition, the young shoots in spring being delicious. The seeds should be sown in April, and the young plants set out as opportunity offers between the middle of June and the middle of August. They are not particular as to soil or situation, although, of course, like all other things, they are best when well-treated. Plant in rows $2\frac{1}{2}$ feet apart, and 18 inches apart in the rows. When land is scarce, set them out between the rows of *Potatoes*, or any other crop which can shortly be cleared off. The *New Hearting* or *Heading*, and the *Asparagus* or *Bude*, are excellent varieties, and the variegated will be useful in winter for garnishing.

CHAPTER XII

The Tomato in the Open Air.—Sow the seeds in February or early in March in pots or pans; cover lightly with sand or sandy soil, and place in a hotbed near the glass. When the young plants appear move them to a warm house, where they will be near the glass, to get hardened by light and exposure. Pot off either singly or two in a pot, standing at opposite sides of the pot, so that when the time comes to plant out the ball may be divided through the middle, each plant taking its share, and but little check need be given. After the plants are potted off they may either be taken back to the hotbed for a few days, or kept in a warm close house till the roots begin work again, when they should be moved to a light place, in order to give strength. Plants that are well cared for in their youth begin to blossom and bear fruit weeks before those reared in vineries or in situations away

from the full light; and in our short, often sunless summers, this is a very important matter. If necessary the plants should be shifted on into larger pots, though a very little check when they have made some progress will do them no harm: it will simply have a hardening effect upon them. As soon as the weather is settled in May, or, say, about the third week, plant out. In the South of England Tomatoes will succeed in any warm position, but they cannot have too much heat in our climate. Though we may plant in any warm situation, even away from a wall, it must not be forgotten that the warmest positions at the foot of a south wall are most advantageous.

The best mode of training is that which ensures early ripening rather than heavy unripe crops; and this can be best attained by confining the growth to one or two main stems, which should be started when the plants are young, by pinching out the leader. A two-stemmed plant will require 2 feet of space or a little more. A plant having only one stem will not require more than 15 inches. As soon as planted, and the soil is settled round them by watering, a tie should be placed to each stem. If against a wall, a nail and shred may be used, but the latter should be placed loosely round the stem to allow space for the large expansion which will ensue. If planted on the open border, a strong stake 4 feet long should be placed near each stem, and a piece of matting placed round the stake and fastened to it first, and then the stem of the plant should be loosely fastened also. In the after-training all side shoots should be rubbed off as they appear (this will involve weekly attention), and all the plant's strength directed upwards into the main stem. Sometimes the leaders are pinched when the first cluster of flowers appears. This throws strength into the blossoms and the next shoot, which breaks away from the leader and grows on till another cluster of blossoms is put forth, when another pinching of the leader takes place, and so on, a check to growth being given as each cluster of fruit is formed. I do not think it really matters much whether these pinchings or checks are given or not, for I have proved that a plant which is allowed to grow straight onwards, unstopped, will bear as much fruit as one that is pinched. All that is gained by pinching is the confinement of growth to a smaller space, and if the wall or the fence on which the plants are to be trained is a very low one, then pinching may be useful, but otherwise is not of much value. Beyond pinching and training, the summer culture is almost nothing. Weeds, of course, must be kept down; and if the summer should be hot and dry, mulching and watering may be beneficial. In cold wet districts the plants must occupy a south wall, and, if possible, lay

a mound of soil (the sweepings of the potting-shed, or old soil saved from the renovation or renewal of Vine or Peach borders will do) against the foot of the wall, and plant in the mound. When the fruits are swelling rapidly and approaching the ripening stage, gradually remove a few of the leaves to let in the sunshine. In autumn when frost is expected the late fruits will ripen off if gathered and placed in a warm kitchen, or in a genial situation anywhere.

The Tomato under Glass.—Given a light house and a night temperature of 60°, the Tomato may be had all the year round. Within the memory of middle-aged people the Tomato was only regarded as a useful sauce-producer. Now it is used in many and various ways; and in the future it is not impossible that varieties may be raised suitable for dessert. Much of this has been brought about by its culture under glass. In the open air, in many places, it is a precarious crop. Very frequently the fruits refuse to ripen, and when they get colour they lack the flavour of fruits grown and ripened under glass; and very often, too, they fall a prey to a disease similar in character and appearance to that which causes such destruction to its relative, the Potato.

RAISING THE PLANTS.—Under glass I have had one set of plants which went through the year without renewal; but young plants should be raised at least every year, as they produce the finest fruit, and are so easily raised that there is nothing gained by prolongation beyond a year. The plants may be raised from seeds, but I like cuttings best, for I think they come into bearing earlier, and the plants are so healthy and strong in both cases that one need not consider the question of losing or gaining in vigour. As a matter of fact, I think the seedlings are sometimes over-vigorous, and require curtailment at the roots in order to moderate the exuberance. The best time to take cuttings is in summer, say in August, and they will strike in a shady place, in a frame, or under a handlight best, or on the shelf in the greenhouse—in fact, anywhere. They are best put into single pots of small size, and shifted into larger ones as required, until the time comes to plant them out. If struck early in August and grown on steadily, they may be taken in a fruiting condition in pots, and transferred to the Tomato-house in time to begin bearing early in spring, when fruits are most valuable, so that really there need not be any break, as the crop in possession of the house, if carefully managed, will go on bearing till the time of its removal. I have said “if carefully managed,” but really very little care is required. To do them justice, they must have

A LIGHT HOUSE.—It may either be span-roofed or a lean-to,

but it cannot be too light. In either case it should be wired, the wires being about as close to each other as would be necessary for vines, and about 9 inches from the glass. The provision for the roots may consist of narrow brick pits, boxes, or large pots. Where convenient, I think the narrow pits are best, but they need not be more than 18 inches wide and 2 feet in depth. Place 6 inches of drainage in bottom, fill it with turfy loam, inclined to be rather sandy than heavy, and top-dress when necessary, giving manure-water if it should be needful, to swell off a crop rapidly.

THE BEST WAY TO TRAIN is to pinch out the leader when the stems are 6 inches high, and from the shoots which break away train up two. These will form the main fruiting-stems, and should be trained up the roof 15 inches apart. All side shoots should be rubbed off, and when the first cluster of flowers show pinch out the leader. Select the next leader which breaks away, and nip out the point of that also when a truss of blossoms has been evolved, and so on till the shoot reaches the top of the house. The close pinching must be persisted in to throw the strength into the plant; and a few of the main leaves may be removed when the fruit begins to ripen, to let in the sun to colour them. As the bottom fruit begins to ripen and is taken off for use, a shoot here and there may be permitted to grow, and these in turn will develop blossoms, when, if the same pinching process be adopted, a successional crop can be started which will prolong the season.

VARIETIES.—For open-air culture—Keye's Early Prolific, Orangefield Prolific, Criterion, Greengage. For culture under glass—Dedham Favourite, Stamfordian, Carter's Perfection, Hathway's Excelsior, Criterion, Large Yellow.

SAVING SEEDS.—This is a very easy matter. Select the handsomest fruit of its kind, and when perfectly ripe break up, and separate the seeds from it by washing. Dry them, and place them in packets for use.

CHAPTER XIII

The Pea.—With every suitable appliance the Pea season may extend from the beginning of May till the end of October, and I have, in exceptional seasons, gathered a dish of Peas as late as the 10th of November. Those Peas gathered early in May are grown under glass, and the very late Peas are, of course, mainly dependent upon the season. The best months for Peas are June and July. In warm situations the produce of the early south border begins to turn in about the end of May, and green Peas are common enough

in June, but July is the month for excellent Marrow Peas. In August and September, unless the land is good and the treatment very liberal and first-rate in every respect, the Peas are most likely to fall away. If they do not cease to bear, the pods lose their fresh green colour, the Peas in the pods are infested with maggots, and if mildew makes its appearance the chapter of ills is complete. Most of these evils may be successfully combated, as I shall show presently. I begin with

THE FIRST EARLY PEAS.—These, where glass can be had sufficient for our needs, will comprise several small dishes in pots of the American Wonder, or some other approved dwarf kind, which should be sown in 8-inch pots in November, and brought on steadily in a pit close to the glass with just the smallest modicum of artificial heat, as Peas do not force well in the ordinary acceptation of the word, and therefore it will not do to be impatient. A steady regular growth, in a very light position, with a temperature never exceeding 45° to 50° at night, will achieve successful results. Ventilation must be given at every suitable opportunity. The first sowing in the open air may take place any time from the beginning of November till March, and the probability is that if the same kind of Peas are planted at both these extreme limits of time, there would not be more than ten days' difference in the period of gathering. But even then the week or ten days gained is highly valued, and many men strive all their lives for a much less tangible result. In cold wet districts it is as well not to sow till after Christmas, as in such situations the early sown crops are not unfrequently cut off by cold winds in association with cold rains. Very often the first early Peas are raised under glass, and when hardened planted out early in March. I have often adopted this plan. The seeds of a white round Pea, such as Ringleader or Sangster's No. 1, are sown in pots or troughs or on sods of turf, and placed in heat; then they soon germinate, and are hardened off and planted on a warm south border the first week in March. A ridge of earth is drawn up on each side as a shelter, and a few evergreen boughs are added as a still further protection. The second early Peas, such as Hundred Fold and Huntingdonian, may be sown at the same time as the early kinds, when these latter are not sown before the end of February.

To keep up a regular succession there should be frequent sowings—taking account of and giving due weight to the fact that all Peas sown during the months of January, February, and the first half of March, will not vary more than a week or ten days at the time of turning in. There is not much use in making succes-

sional sowings during these months. As a matter of fact I have often sown at intervals of a fortnight or so in order to test the matter, and I have always found that to obtain a succession from the first sowing the best plan is to sow at least three or four sorts at the same time, including an early kind, a mid-season one, and a late variety. After April comes in sow the succeeding crop as the preceding one is just through the ground. The following dates may be taken as approximately correct. They are founded upon a good deal of experience and careful note-taking, and—making due allowance for the effect of latitude upon climate, and the variations of soil and seasons—may be safely acted upon. Early white round Peas, of which Ringleader may be taken as the type, sown before Christmas, or not later than the first week in January, should be fit to gather the last week in May. William I. and those of a second early type, sown from the end of January to the end of February, should be fit to gather from 10th to 20th of June; Huntingdonian and Telephone, sown from 20th of February to 10th of March, should be fit for use from 20th of June to middle of July, or later. Marrow Peas, such as Veitch's Perfection and Ne Plus Ultra, sown from middle to end of March, should be ready about the middle of July and onwards. The tall Marrows, sown first and third week in April and first and third week in May, should produce a supply from the middle of July till the close of the Pea season. Most people sow second earlies once or twice in June, and I have seen the late Marrows do well sown as late as the middle of June.

THE LATE MARROW PEAS.—The crop is so important that every expedient should be adopted which can in any way enable it to pass through its difficulties without much suffering. I have seen men labouring heavily with watering-pots in a dry hot time, when less than half the time and labour in preparatory work in January would have produced more satisfactory results. I do not care so much about planting the late Peas in trenches, especially if it decreases the depth of soil; but I do believe in marking out the sites, say, in January or February, opening a trench, and filling in with a manurial compost—Peas dislike rank manure—of the usual decaying matters which accumulate about a garden, mixed with a proportion of manure from the stables or pig-sty, with a little soot, etc., and the whole blended together and worked into the trench, where the Peas will by and by be planted. When this is done early in the season the added compost has become mellow, and is in a fit condition for the roots of the plants to work among at once. As much of the soil taken out of the trench as will fill it to the original level may be thrown back and worked

up with the compost. The bottom of the trench will also be stirred up and incorporated. All the stations required for the late Peas should be got ready at the same time, and a stump driven down at the end of each row, so that when one wants to put in a row of Peas all he has to do is to place a line along the line of stumps, draw a drill about 3 inches deep, and plant the Peas. As regards the

MANNER OF PLANTING THE PEAS, I should like to say a few words. The large Marrow Peas should have room to branch out, not only below the surface, as the preparation of the site suggested above will provide for, but also above the ground, and this must be provided for by thin planting. From 2 to 3 inches apart all over the drill will not be too much space to allow; and this will necessitate the careful distribution of the seeds individually by hand. In dry weather the drills should be soaked with water, and then covered with the dry soil drawn from the drills. If mice are likely to be troublesome, dress the seeds with red-lead, or keep traps set in the neighbourhood of the Pea row. To do the late Peas justice the rows should be isolated, with other dwarf crops between. Mulching with manure is a very valuable expedient, and in connection with a good preparation of the land at this season should render watering, even in the driest weather, unnecessary. The mulch, which should consist of half-decayed stable-manure, should be spread on both sides of the rows of Peas, 18 inches or so wide, and 3 or 4 inches thick.

GATHERING THE PEAS.—This should be done carefully, and as soon as they are fit for use. In many cases a second crop of young shoots and blossoms will put forth, and a second crop of Peas, which is very useful, will be produced. All annual plants will make a supreme effort to produce seeds, and Peas are no exception to this rule.

TALL AND DWARF PEAS.—Dwarf Peas are very useful where sticks or supports cannot easily be obtained; but where sticks do not cost much, I should prefer, for the main crop, tall Peas, as they are more prolific. In the case of all Peas requiring support—and, if possible, all Peas, even those of dwarf habit, should be supported—the sticks should be placed to the rows early, their tops levelled with the shears, and the pieces cut off used between the large sticks at the base, to prevent the plants straggling through, and give them an upward tendency. In the lists which follow I give the heights of the different varieties, although, of course, my readers will understand that soils and seasons have much to do with the height attained by Peas.

VARIETIES.—*First Earlies*—Beck's Gem, 1 foot; American

Wonder, 1 foot ; Ringleader, 2 feet ; William I. 3 feet. *Second Earlies* — Hundredfold, 4 feet ; Culverwell's Telegraph, 4 feet ; Huntingdonian, 4 feet. *Main Crop* — Blue Scimitar (this is a very useful old Pea, and very reliable for bad seasons), $2\frac{1}{2}$ feet ; British Queen, 6 feet ; Ne Plus Ultra, 6 feet ; Omega, $2\frac{1}{2}$ feet ; Telephone, 4 feet.

CHAPTER XIV

The Onion.—This chapter might be divided into two sections—first, the autumn or winter crop ; second, the spring-sown Onion. Taking the first section in the order set down,

THE WINTER ONIONS are commonly confined to the Tripoli section ; but this is by no means necessary, as the White Spanish, the Globe, and all the best keeping varieties will succeed just as well sown in autumn as the Tripoli. Indeed, wherever the Onion maggot is very troublesome I should strongly recommend autumn sowing to get the plants in advance of the maggots. I have sown this class of Onions from the 1st of August to the 10th of September, and I do not think any hard or fast line should be laid down, as the climate varies so much, and the character of the season should be taken into account ; but somewhere about the middle of August is a good time. Sow on rather firm land—I mean land that has not been recently dug with a spade or fork. The surface may be deeply hoed or scuffled over with some suitable tool, and, of course, it should be in good heart ; but a top-dressing of soot, salt, and superphosphate may be given with advantage when the stirring of the surface takes place. Sow in drills from 9 to 12 inches apart, and keep free from weeds through the autumn and winter.

TRANSPLANTING may take place any time during February or March, but the earlier the better, provided the land is in good condition ; in fact, the preparation of the land is very important, for to grow large Onions of mild flavour it must be rich, and should at the same time be firm if the bulbs are to ripen perfectly. The best plan is to wheel on a good dressing of manure in December—not later, if possible, and ridge the ground up roughly immediately after. If there has been any injury from maggots or fungi during previous years, give the land a good dressing of salt, soot, and lime in something like the following proportions :—5 bushels of soot, 5 bushels of lime, and 56 lbs. of salt, the whole to be thoroughly mixed together, and laid in a heap to amalgamate a month or so before using. This quantity will be sufficient for a bed 4 rods or

perches in extent. The quantity can be increased or diminished to suit differently-sized plots. After the ridges are forked down, towards the middle of January, the mixture should be spread over the surface and lightly forked in, and the land left exposed to the benefits of the weather till it is convenient to plant. To obtain very fine Onions the plants should have room. It is true that I have seen good Onions grown where scarcely any thinning had been done, and some people might infer from this that thinning was rather a disadvantage than otherwise. But a lengthened experience tells us that thinning spring Onions to 3 or 4 inches apart on the bed, and allowing such large winter kinds as Giant Rocco 6 inches of space, is a requisite of good culture. If the surface is dry it can scarcely be made too firm either for sowing or planting. The roots must all be covered, but the stem should not be buried too deep in the soil.

SOWING THE SPRING ONIONS.—In the preparation of the ground the same thoroughness is necessary as was recommended for the transplanted winter crop, and the dressing of salt, soot, and lime during the winter preparation should not be omitted, as it has great value in clearing the land from fungus spores and the chrysalis of the Onion-fly. It is not wise to lay down any special rules about the time to sow, as it is more important to get the land into the right condition than to sow on any particular day. At the same time, there should be no unnecessary delay after the first week in March, as the season of growth is a short one, and unless they are started as early as can be done with safety the bulbs must be small, for the growth will cease when the hot weather comes in August, if not sooner. In unfavourable situations the seeds may be successfully sown as late as the end of March. The best way is to draw drills from 9 to 12 inches apart and half-an-inch deep, scattering the seeds evenly and not too thickly along the drills, covering afterwards with the feet and treading-in. In difficult situations and seasons I have covered the seeds with the compost saved from the clearing up of the rubbish heap, including ashes and burnt earth, which form a part of the heap. I always save the best of this material for covering seeds. It is passed through a sieve, to take out stones and the remains of sticks, etc., and is excellent for covering Onions, Carrots, Parsnips, and Turnips in a difficult time.

THINNING THE CROP.—This should be done as soon as the plants are large enough, and they can be drawn out easily without loosening those intended to remain for the crop. It is not advisable to have the plants too thick on the ground, yet there should be a power of selection to make the most of the land, for if we

take any given number of seeds a certain proportion of them, under equal conditions, will grow larger bulbs than the remainder ; and if we can keep those which are inherently great, we shall obtain the best possible crop that circumstances permit of. The distances between the bulbs need not be uniform. The practised eye will form an opinion promptly as to the capabilities of each plant from the leaves, and it would be wasteful to leave a plant 6 inches of space which could profitably occupy only 3 inches. The thinning is best done in showery weather, as any loosening of the plants will then be less hurtful to them.

THE SUMMER MANAGEMENT will consist chiefly in keeping down weeds, and to do this well they should be attended to when they are small. Hoeing will do the greater part of the work in the early life of the plants ; but later on, when the tops are meeting, weeding will be better than too much hoeing, as the hoe, if used roughly, may injure the plants. Nitrate of soda, 5 or 6 pounds to the rod, is a good top-dressing for the Onion during its season of growth ; it may be given in showery weather any time, and will assist the plants in escaping from the maggot, should it attack them.

HARVESTING.—When the usual indication of a cessation of growth (a drooping stem) appears, all stems which are not falling over naturally should be bent down to facilitate the ripening of the bulbs. When growth has finished the bulbs should be pulled up and laid out in the sun to complete the ripening ; then, in due course, they should be stored. All having stems long enough to tie into bunches should be so treated, and hung up in a cool airy shed ; if kept dry, cold will not injure them—indeed, the late kinds, if well ripened, can hardly be kept too cool. Those not long enough to tie up may be laid thinly on shelves in a cool place, or some of them, if there are many, may be pitted like Potatoes. If they have a good cover of straw, they will keep well in this way a long time.

DISEASE AND INSECTS.—The chief ailments of the Onion plant are mildew and maggots. Sometimes, after a severe drought, the first attacks the tops and stops growth ; at other times it attacks the roots and works upwards. In either case the best remedy is the dressing of salt, soot, and lime, prepared as I have suggested, in winter, and again in spring after the Onions are up. This dressing is also beneficial in the case of the maggot attacking. Its action is chiefly preventive, as nothing can save a plant when the maggot once works its way into the bulb. The larvæ of the Onion-fly lie in the ground all the winter, and the dressing recommended will tend to destroy them. Gas lime in small quantities may be useful

for the same purpose. About the middle of April all those chrysalises which have escaped come out as perfect flies, and soon begin to lay their eggs on the stems and leaves of the plants. In this condition many might be found and destroyed if sought for, either picking them off or adopting the readier plan of crushing them between the fingers. All infected Onions should be pulled up and destroyed, to make sure of extirpating the maggots which they contain.

VARIETIES.—Magnum Bonum, Cantello's Prize, The Banbury, Danver's Early Yellow, James Keeping, Nuneham Park, Giant Zittau, Giant Rocco, and the Queen.

CHAPTER XV

The Mushroom in Buildings.—Any building that has a fairly equable temperature will grow Mushrooms to perfection. I was at Battle Abbey some time ago and saw there excellent crops of Mushrooms growing in the underground caverns or cellars belonging to the old abbey, which formed the wine cellars of the monks. The warmth arising from the fermenting dung kept up the requisite temperature in a building surrounded by thick walls or covered in with earth. Excellent Seakale was also produced in the same places under the like conditions. An underground cellar is an excellent adjunct to the garden for Mushrooms and other things which need not be further alluded to here. Properly speaking, in the best gardens, the Mushroom-house is usually a well-constructed building at the back of the range of forcing-houses. It should be built in such a manner as to be uninfluenced by external changes of temperature. The roof inside must either be ceiled or boarded, and though there should be the means of letting in light and air the necessity for it will not often arise. The usual arrangement of the interior is to have a path $2\frac{1}{2}$ or 3 feet wide down the centre, with beds 3 to $3\frac{1}{2}$ feet wide on each side. If the building has a lean-to roof there will be room for three beds at the back and two at the front, placed one above the other, and large quantities of Mushrooms may be had in succession all the year round—except, it may be, for a month or two in the hot weather, when open-air beds will be more satisfactory. The receptacles for the beds may be constructed of timber, or arches of brickwork may support slate foundations; the latter mode of construction is very substantial and lasting, and good strong work is cheapest in the end.

Mushroom beds may be made up at any time, but the most successful are generally made in autumn, September and October

being the best months. Many cultivators make up a number of beds then, and spawn them when ready, but do not apply the soil till some time after. I have had beds left without soil till they had become one mass of spawn two or three months after spawning, and such beds always produce large crops of very thick fat Mushrooms. Usually a Mushroom bed will begin to bear in about a month or six weeks after soiling; but it must be confessed that they are rather erratic in their movements, and will not always begin to bear so soon. The materials for the beds should be as fresh as can be obtained, and should not have undergone any violent fermentation. The manure must be dried, but without being exposed to violent heat. As the manure is collected, spread it out to dry in an open shed, and turn it every four days. It may heat mildly, but strong heat is injurious. Some beds are made up with horse manure alone, and when this is plentiful nothing else need be used. The manure should be obtained from stables where the horses are well fed upon dry food—that from entire horses being considered the best. Mushroom beds have been known to fail through using manure from the stable where the horses were taking physic, or having a large allowance of soft food, such as Carrots, etc. All the littery material should be taken out, but I have often used the latter to form the foundations of the beds, damping it if dry, and laying from 6 to 8 inches of droppings on the top for the spawn to work in. Very often when droppings have not come to hand fast enough, I have used a proportion of loam with the manure in making up the beds, varying the quantities a little according to the freshness of the manure. Usually one barrowful of loam to three of manure will do very well mixed together. If this proportion be observed the manure may be used nearly fresh or with very little drying. Similar materials blended in the same way will do, no matter where the beds are made, whether in the open air or the Mushroom-house.

Having obtained a sufficiency of the proper kind of material for a bed, in the right condition—that is, thoroughly intermixed—a layer 4 inches thick should be placed on the floor of the bed, and trampled or beaten with a wooden mallet. Another layer of equal thickness is added, and the same beating process carried out, and so on till the bed is made of sufficient thickness, or say about 1 foot or 15 inches in depth, which will be enough at all seasons for beds in heated houses. Where there are no means of applying artificial heat, such as pipes or flues, the bed may be increased a little in thickness, in order to cause a little more warmth; but firmness is very essential, as the bed may get too hot at first and then become cool afterwards, though coverings of litter may be

used in unheated buildings to keep the beds at a regular temperature.

GOOD SPAWN is very important. No matter how much care and pains may be taken in selecting and preparing the other materials, yet, if the spawn is old or bad, all the labour will be in vain. The question may be asked, "How shall we know good spawn from bad?" If a brick of spawn is broken through, its appearance and smell will indicate whether it is capable of producing Mushrooms. Spawn originally good may be rendered useless by bad keeping. If kept in a damp place it may run itself out, become exhausted, and perish. When it arrives from the dealer it should be placed in a dry warm place and kept there till required for use. It will then keep in good condition a long time.

TEMPERATURE.—It requires rather more warmth to start the spawn into work than is required afterwards. If the heat of the bed rises to 90° or a little more when first made, as soon as the highest point has been reached and the heat begins to decline, the bed may be spawned. It is better to spawn at a temperature of 90°, if the heat is gradually declining, than to wait longer, as we lose time by waiting. When in full bearing the temperature of the bed must not be allowed to fall much below 60°. If at any time beds in the open air or in unheated buildings become too cold, add to the coverings. In cold weather I have found it advisable to employ linings of manure to keep the beds at a comfortable warmth. The bricks of spawn should be broken up into pieces as large as hen's eggs, inserted just within the warm manure, 9 inches apart, and pressed or beaten down firmly. As soon as the spawn begins to work freely the bed may be soiled—2 inches of loam made firm by beating with the back of the spade, damping the surface, and passing the back of the spade over it at the last to give a smooth finish. If the house is heated with pipes there should be troughs on the top to secure a moist atmosphere, or the same condition may be obtained by syringing the walls and path twice a-day.

COVERING THE BEDS AND WATERING.—A thin covering of hay or straw tends to keep the temperature of the bed steady and preserve the moisture, and the Mushrooms seem to like it; but the coverings must be changed sometimes, for if they get damp the spawn may run out of the bed into the covering, and exhaust itself uselessly. Open-air beds of course must have covers, but heavy rains should not penetrate so as to saturate the hay or litter next the bed. Beyond surface sprinkling occasionally no water will be required till the beds have been in bearing some time. After the first crop has been gathered and exhaustion seems to have set in,

liquid manure may be applied with advantage. Guano, at the rate of half an ounce to a gallon of water, may be given at any time the beds require water. A pinch of salt may be added with advantage to each potful of water. The water should always be given warm—say at 85°.

GATHERING THE CROPS.—The age at which Mushrooms are gathered must depend on the purpose for which they are used. For grills, of course, Mushrooms must be nearly fully grown. They may be said to be at their best when nearly but not quite fully expanded, just before the fringe or beard, which attaches the outside edge of the Mushroom to the stalk, separates from the latter. The gills inside are then a bright pink, and the Mushrooms are more delicate in flavour than if left to get old. In gathering draw the Mushroom out of the bed with a quick twist, and after each cutting fill up the holes with some fresh loam. Mushrooms have been grown in many places, some of which, at first sight, might appear unlikely to secure success; but if we possess the requisite materials for making the beds, and the right temperature can be secured, they may be grown anywhere. I have grown them in champagne-cases, filling the case two-thirds full of manure, and spawning and adding soil when the right temperature had been reached. The lid of the box may be closed, and the box carried into the house or stable, or placed under the greenhouse stage. A succession can easily be kept up if we possess half-a-dozen boxes, filling one every fortnight or so. Mushrooms can be grown just as well

In the Open Air, provided the requisite covering can be had, as in a building. The Mushroom requires certain conditions as to warmth and moisture, and provided these are present it does not matter a straw where the beds are situated. There is, of course, more trouble with beds in the open air, but otherwise the means required are the same for one set as for another. The beds should be larger in order to secure a more regular temperature, as the heat is steadier in the large bulk than in the small one. The open-air beds should be built up in the form of a ridge, about 3 feet wide and as much in depth or thickness, the sides tapering up to a point, the spawn being inserted on both sides of the ridge. It is a good plan to make the beds against a wall in a position not much influenced by the sunshine, north being the best, especially for summer. In this case the ridge will only have one side to spawn, but the back of the bed will be higher than the front, thus giving a long face. Mushroom beds are sometimes made by digging out the soil and filling in with stable manure, and, as soon as the temperature is right, inserting the spawn. I like the beds

above-ground best, as they are more under control. Mushroom beds are often made up in pits or frames, and I have seen excellent crops grown in an old-fashioned vinery in the pit that ran along the centre of the house, making up one piece at a time to form a succession. Where only two or three beds are made up in the year it is best to buy the spawn, but where a constant succession is kept going the spawn would cost a good bit of money at 5s. per bushel; and then it is better to spawn one bed from the other, which is easily done if the spawn is not too much exhausted.

INSECTS, DISEASES, ETC.—When damp and cold, the young Mushrooms sometimes damp off; and the same thing may happen when the temperature is too high and the house kept too dry. Under the last-named conditions they run up spindling, with long stalks, and are generally weak and poor. From 55° to 60° is the best temperature, and this should be kept regular and steady. Woodlice are the most destructive insect pests to the Mushroom crop. The best way of dealing with them is to pour boiling water round the edges of the beds between the manure and the wall, as they hide in such positions when they are not feeding. A toad or two in the house may be useful, if the number of insects in the house is not too great. Traps, consisting of empty flower-pots, 5 or 6 inches in diameter, with a wisp of dry hay loosely thrust inside, to form a shelter for them, may be used. The insects hide inside the pots, and should be destroyed daily by throwing them into a pot of hot water. Snails are very often destructive to the beds in the open air, and must be sought for diligently every time the beds are uncovered. Greased Cabbage leaves placed near will tempt the slugs and snails to show themselves, when they may be caught and destroyed. Bran or grains will do as well or better.

CHAPTER XVI

The Parsnip.—The cultivated Parsnip, like the Carrot, has been evolved from a native stock, which may be found in abundance in some places. It will grow in any soil, but the best and clearest roots are obtained from deep soil of medium texture, rich from previous manuring. Where fresh manure is used the roots often canker round the crown, and the flavour is not so good as when sown on land rich enough without fresh manure. Parsnips may follow Celery or Cauliflower, or any other crop for which the land has been much enriched. Soot and salt may always be applied, as their tendency is not only to enrich the land, but to cleanse it from insect and fungoid pests. The roots of the Parsnips descend

deep into the earth when they get a chance. I have lifted roots whose tap-roots could be traced 4 feet deep; hence the value of deep culture early in autumn, the land to be thrown up roughly to sweeten and pulverise it. Towards the end of January the surface should be turned up with a steel fork; the dressing of soot, etc., may be applied then, and forked in. About the end of February or the beginning of March is a good time to

SOW THE SEEDS, which should be new or nearly so, though two-year-old seeds will grow very well. Sow in drills, which should be 18 inches apart, and about half an inch deep. The seeds should be scattered thinly and evenly; select a calm day, and cover with fine soil. Sow only when the surface is dry, and run the feet along the drills when the seeds are covered, to make all firm and snug.

THINNING THE CROP.—As soon as the little plants appear above ground, run the Dutch hoe between the rows to loosen the soil, and kill the annual weeds which generally make their appearance at this season. Frequent stirring also pushes on growth, as there is something about a freshly-stirred surface that all plants seem to enjoy. When finally singled out the plants should stand from 6 to 9 inches apart. After thinning is finished an occasional hoeing is all that is needed till the crop is fit to lift. Parsnips are fit for use when large enough, but many think they are better flavoured after frost sets in. The roots should be lifted fresh from the ground as required, for if taken from the moist earth, they soon shrivel; but they should all be lifted before growth is much developed in March. A considerable bulk per acre can be grown; therefore Parsnips are a profitable crop to grow for stock feeding. They are excellent for milch cows, and all kinds of stock eat them readily.

VARIETIES.—Elcome's Improved Guernsey, the Hollow Crowned, and the Student, comprise the chief varieties. The last-named is an excellent variety for garden culture.

SAVING SEEDS.—Select some of the handsomest roots early in February, and plant them in rows 2 feet apart. Thin out the umbels of flowers where the plants are very strong. Some people cut out the centre; this prevents overcrowding. When approaching ripeness cut the stems, and hang them up in a dry room or shed to complete the harvesting; then the seeds may be thrashed out. Carrots may be served in the same way.

Vegetable Marrows.—The site for these, provided it be an open one and away from the shade of trees, is a matter of little consequence. Sometimes accumulations of rubbish are gathered together in out-of-the-way corners, and a group of Vegetable

Marrows is planted on the summit of the mound, and soon spreads all over it, bearing immense numbers of Marrows. The common way of preparing for Vegetable Marrows is to select a piece of ground in an open situation, and mark out the places for the plants 8 feet apart each way. Vegetable Marrows do not require strong manures. They lead to strong growth, but this is not often so prolific as that of moderate strength. Compost which contains a good deal of earthy matter, such as turfy loam, is the best for Vegetable Marrows. If Manure is used, it should be mixed thoroughly with the soil, which must be well broken down with the fork or spade; and in this nicely-worked friable bed either plants or seeds may be set. Usually, where there are glass structures, the seeds are planted under glass. In

RAISING THE PLANTS it is not well to sow the seeds too early. I find the first week in April quite early enough. The seeds should be planted in 4-inch pots, filled to within an inch of the top with nice mellow soil; plant two seeds in each pot at opposite sides, and cover half an inch deep with sandy soil. The pots should then be placed in a pit or frame where there is a little warmth, but not sufficient heat to draw the plants up weakly. As soon as they are strong enough they are hardened off, and planted out about the 20th of May. If there are any handlights available for their protection they may be planted a little earlier; but the plants are tender, and they should not be put out too early without some means of protection. Even when I defer planting till the 20th of May, I always have some large flower-pots handy to place over the plants should any signs of frost appear, or the wind be cold.

IN PLANTING, the soil should be pressed firmly about the base, and the work finished off in a workmanlike manner, leaving a basin or hollow round the plants to hold water, if it should be necessary to give some—as it probably will be till they are fairly established. So far as regards delicacy of flavour young Marrows are the best, and by cutting all as soon as they are large enough for use, a continuance of nice young Marrows will be produced. When left to get large, bearing soon ceases, as the plants get exhausted.

SAVING SEEDS.—There is no occasion to save every year, as, if kept dry, the seeds of this family will retain their vitality for many years. If one of the handsomest fruit be left to ripen, seeds enough will be produced to supply a moderately-sized garden for a number of years. Vegetable Marrows may be trained over faggot heaps or buildings, and so be made to yield some ornament, but they bear quite as well trailing over the ground. It is a good

plan to mulch between the plants with long litter as soon as they get nicely into growth. They derive a good deal of benefit from mulching, and it keeps the fruit clean.

VARIETIES.—For ordinary use the long white Marrow, cut when quite young, will supply every need. Other varieties are the Custard, Shirley Hibberd's Prolific Early, Muir's Hybrid, and Moore's Cream. Hibberd's Early and Muir's Hybrid are both good.

CHAPTER XVII

Rhubarb.—This has become a valuable plant, and scarcely anything pays better for good culture. It likes moisture, and on very poor porous soils, unless well fed, the stalks do not attain a very large size. The ground cannot easily be made too rich; and, as the plants will occupy the same ground several years, it should be well done before the roots are planted. Early in the month of March is

THE BEST TIME TO PLANT, just as growth is beginning to move. The intended site should be manured and trenched or ridged early in winter, and forked over again in February to get the land into a nice, warm, friable condition. The sets may either be single eyes or pieces of root containing several eyes or buds. The crowns should be divided with a sharp spade, and the pieces planted in rows 4 feet apart each way; but the plants should not stand opposite each other. The Victoria should be planted 5 feet apart each way, as the growth of that variety is large and spreading. Rhubarb, like many of the so-called permanent crops, is frequently left too long on the same ground. To have really fine Rhubarb the plants should not remain longer on the same spot than from six to eight years, and by the removal of the Rhubarb plantation occasionally more space will be available for the rotation of other crops. If left too long on one spot it deteriorates, and not only do the stalks get weaker, but the whole plant loses strength and force. When that condition is reached it will take more than one year of good culture to restore vigour. Rhubarb repays well for

LIQUID MANURE, which may be given any time. A good soaking after pulling has ceased will be a great help in giving strength to the crowns for the next year. Mulching is of great use also; if put on early in the season it will hasten the growth, and as it decays later on it will nourish the roots. No one cares much for Rhubarb puddings or tarts after Gooseberries come in; but very often there is a demand for Rhubarb then for wine-making, and it makes

excellent jam when fruit is scarce, so that there is always a temptation to pull away at it as long as any good stalks remain. This must only be allowed to a limited extent, as it weakens the crowns very much, and, if persisted in, the crop next year will be a poor one. It is impossible to eat one's cake and have it too. Some years ago I knew a Rhubarb-grower who was making a good sum out of his Rhubarb plantation, which occupied a warm site, and the crop from which came in early. In an unlucky moment he yielded to the temptation offered by a wine-maker for his surplus crop, and pulled it very close late in summer. His crop the following year was a very poor one, through the weakening effect of late pulling. Leaves are necessary to carry on the work of the plant, and a fair proportion of them should be left to die off naturally to feed up the crowns for the next year.

RAISING PLANTS FROM SEEDS.—Very few people do this, except for the purpose of experiment, or to raise new varieties, as in dealing with established plantations every eye will make a plant. The seeds should be gathered when ripe, and placed, when well dried, in a drawer till spring, and then sown thinly in drills 2 feet apart. Transplant at the end of the first year 3 feet apart, and encourage any of the seedlings which give evidence of the possession of superior merit.

VARIETIES.—*Linneus*, *Prince Albert*, and *Victoria*. The above are three of the best old varieties. A kind called *Paragon* has been highly spoken of for earliness and productiveness. I grew a variety in Norfolk named the *Raspberry*. I suppose it was only a local variety, but it was higher coloured and better flavoured than most. The *Victoria* is the best for exhibition.

FORCING.—Rhubarb forces very easily anywhere, but it should be grown in a pure atmosphere, or the flavour will be destroyed. It may be covered with crates, tubs, or pots, and surrounded with leaves and manure well mixed together. After Christmas a very little warmth will start the early sorts, such as *Linneus* and *Paragon*. One of the best and commonly practised ways of forcing Rhubarb is to take up the roots and place them closely together in the Mushroom-house or any other building where warmth can be had. In this respect the Rhubarb is very accommodating, for it flourishes in any temperature up to 65° ; but 55° is best, as it forces without unduly exhausting. The interstices between the roots should be filled up with light rich soil. After the produce has been gathered the roots may be moved to the open air, protected with litter, and, after a time of rest, cut up into sets and planted. The same roots cannot be forced the next year, so provision must be made for raising a new lot. In the course of two or three years the roots

first forced will be strong enough to force again. Successions of roots should be taken up monthly at least, beginning towards the end of November, and finishing 1st of March.

CHAPTER XVIII

Celery.—This is one of the most useful of winter vegetables, and has been recommended to be eaten by those who suffer from rheumatism in any of its forms. Scarcely any one grows enough even to meet the demand there is for it in a raw state. It makes a delicious dish when stewed, after it has been well grown and properly blanched in autumn and winter.

FOR EARLY USE seeds of a good white and red kind should be sown in heat early in February. The seeds are small, and must not be covered too deeply. I simply cover with a sprinkling of sand. They take some time to germinate, and should be kept at an even state of moisture. When the young plants appear, if they seem thick in the pans or boxes, weed out a few of the weakly ones, place near the glass in the full light, and when large enough to handle prick off into other boxes or into pots. If in boxes, set them 3 inches apart, to give room enough for full development. If in pots, either pot singly in 3-inch pots or place three or four plants round the sides of a 5-inch pot. They must occupy a light position in a genial temperature, where there is artificial heat enough to ensure regular steady progress, but not enough to draw the plants up weakly. In April move the plants to a cool pit or frame, and harden off preparatory to planting out in May.

THE MAIN CROP should be sown early in March, and this also must be done in a nice genial temperature. A vinery at work, where the boxes can get a fair share of light, will do. Sometimes, where a large number of plants are required, a hotbed is made up on purpose for the Celery. It should be made of two-third leaves, mixed with one-third stable manure; and, as soon as the frame and lights are placed on, 6 inches of soil may be placed over the bed, pressed down to give firmness, and the seeds may be sown. There is no occasion to wait for the heat to get up, as we know that with such a bed the temperature will not get too high. The moisture and air in the soil will be acting upon the cuticles of the seeds, and when the heat rises the young plants will be in a condition to move. In any case, when the young plants come up—whether sown in boxes, or on the surface of a hotbed—the weaklings had better be taken out.

In pricking off the plants, I do not think there is any necessity

to use bottom-heat for the crop. If the young plants have been carefully treated and properly hardened, a close frame should do admirably. Place it on a hard bottom, lined with coal-ashes, so as to keep out worms. On this place 3 inches of very old manure, pressed down firmly, and on the manure place 2 inches of light rich soil, and in this prick the plants from 3 to 4 inches apart. Very often a temporary place is made for them with boards, with a covering of oiled calico instead of glazed lights. Very good plants have been obtained by this latter plan. Glazed lights, of course, are best; but the simpler, more economical plan will yield successful results. For late use, a third sowing may take place towards the end of March or beginning of April. Very often this sowing is made outdoors, in a warm corner, among light rich soil specially prepared. In establishments where Celery must be had as far on as possible, this late sowing is very useful; the plants produced from it do not bolt so early as those sown earlier. I know many people only sow once, but there is an advantage in doing as I have set down here.

PREPARING THE TRENCHES.—It is a good plan to get the trenches ready as early in the season as possible, for then the soil and manure become so nicely blended that the plants sustain less check, start away at once, and grow steadily and continuously. Whatever manure is used should be well decomposed; but a crop like Celery, which depends so much for quality upon regular treatment and the absence of fluctuation, either from forcing manures or any other cause, will always succeed best when the manure for the Celery trenches has been worked into a compost. Assuming that we know at the beginning of autumn how much manure will be required for Celery, late Peas, Onions, and any other crop for which special preparation is made, we commence to form the heap of compost by laying the proportion of manure from the stables and pig-sty and old hotbeds in a heap; to this is added a part nearly equal in bulk from the heap of decayed vegetable matter, sweepings from the potting shed, some burnt earth and wood-ashes, and some soot and lime. This is all mixed together, and, the manure being rather fresh, it will ferment a little, but not enough to do harm, as the earthy matter arrests and absorbs all manurial gases which might otherwise escape. This will be turned perhaps twice in winter during frosty weather, and in March it will be in excellent condition for putting in the trenches and mixing with the soil. If the trenches have to be made later, near the time of planting, the result will be better than if strong manure were used. The cause of hollow stems and rough coarse produce might often be traced to improper manuring. The size and depth of the trenches are

matters of less importance, as local circumstances may have some influence ; so also is the question whether the rows shall be single or double, or the bed system adopted. In small gardens, and for late use,

THE BED SYSTEM of planting has advantages. It economises space, and on inferior soils the strength is not so likely to be washed out of a large mass of rich soil as out of a narrow strip. The earliest plants may be set out as soon as they are ready in May, and as little disturbance of the roots should be suffered as possible. The holes should be made with a trowel, and be large enough to receive the ball of earth and roots. The soil should be crumbled-in round and over them, and enough pressure given to make all sufficiently firm. Watering and shading should follow if the weather is dry. A few branches laid across the trenches may furnish sufficient shade, and their shelter may also be beneficial. The main crop should be put out towards the end of June, and the late crop in July and August. I have often had useful Celery, not large, but sound and good, from making a plantation on the level ground towards the end of July, without any great amount of preparation, simply using up the surplus plants. They are planted in rows across a border, and mulched and watered if they need it. They grow until November, and are then tied up and blanched with ashes.

THE TRANSPLANTING should be done, if possible, in showery weather, or in the evening. It is a bad practice to plant during hours of sunshine, as the fewer and less severe the checks are the better. To obtain really first-class Celery the treatment must be regular—the plants should not be nourished and starved by fits and starts. Water should be given when needful, but not otherwise, as one cannot deluge the land with water without washing some of its goodness down to drains. Though this tendency can be met by giving liquid manure, yet if the land is moist enough for steady progress, that is all that is required. To enable the plants to do with as little water as possible, the soil between the plants should be mulched with old hotbed manure, leaf-mould, or something of a like nature that will check evaporation. The growth at first will be slow, but when the nights begin to lengthen and the dews of autumn appear on the foliage, the progress is rapid. The distance between the rows must depend upon the kinds grown. Tall vigorous varieties, such as Sulham Prize, must obviously have more room than such dwarf kinds as Incomparable Dwarf White, or Carter's Incomparable Dwarf Crimson, both excellent kinds. Four feet from centre to centre will give abundant space for dwarf sorts, but 5 feet will not be too much for tall kinds if planted in

single rows. If double rows are planted, the spaces in each case should be a foot more. Where the bed system is adopted, the trench may be from 4 to 6 feet wide, and contain from four to six rows of plants.

EARTHING-UP.—A little earth will be scattered round the plants when hoeing, and later on the edges of the trenches may be hoed down with the view of giving the leaves an upward tendency. This may be done without stopping the water supply if the weather should be hot and dry. But the principal earthing-up should be done all at once, about five weeks before the Celery is required for use, and when the necessity for artificial watering has ceased. Every part of the plant must be dry, and any small outside growths, which will be of no value, may be taken off. It is a good plan to wind a string of matting round each plant before the earth is placed to it—this saves an extra hand, and the work is better done. Frequently, in earthing-up Celery, one walks backwards astride the row and holds the plants up in succession; a couple of men move on each side parallel with him, break down the soil, and place it round the plants with spades. It is important that the soil be well broken up, and it should be built up carefully round the plants, but not so high as to fall over into the heart, as that will not only check growth but bring on decay. In soils much infested with snails a little lime or soot may be scattered along beneath the foliage, after the plants are tied up, and mixed with the soil. A few coal-ashes may also be used with advantage, as snails will not penetrate far where ashes and soil are mixed. If the Celery is expected to keep far into the winter, the ridges or banks of soil should be made straight and firm, with a smooth face to throw off the water.

PROTECTING IN WINTER.—At the approach of very severe weather a few dozen heads may be lifted carefully without any trimming, and be laid in damp sand or ashes in a pit, or where it can be readily got at when wanted for use, and easily protected from frost. But the main bulk of the crop will have to be sheltered where grown with dry litter. It is best to wait till the first night of frost is over, and then, when the top of the ground is frozen, the weather looks settled, and the frost likely to continue, cover the rows not only on the top but also on the sides with dry litter, and the covering must remain on till the frost is over.

VARIETIES.—*White*: Incomparable, Grove White; Seymour's Solid White. *Red*: Carter's Incomparable Crimson; Major Clerk's Solid Red, and Sutton's Sulham Prize Pink.

DISEASES AND INSECTS.—Of these the Celery fly (*Tephritis onopordinis*) is the most troublesome. The pupæ or grubs remain

all winter buried in the earth in the chrysalis state, and in spring all that survive are transformed into flies, which in summer lay their eggs on the foliage of the Celery plant. In course of time these become small brown maggots, which lie within the membranes of the leaves, producing a most disagreeable burnt-up appearance, and effectually checking the growth of the plant. The best remedy is to try to stamp it out by picking off the affected parts and burning them. In districts where the fly has been troublesome in previous years, syringing the plants about the commencement, or, rather, perhaps just before the eggs are deposited, with something distasteful to insects, has been found beneficial. Gishurst compound and Tobacco liquor are good. Soft soap is also beneficial, and the slops from the house may be diluted and applied over the foliage with a rosed pot; but several applications of all these remedies or preventives will be necessary. Slugs in damp soils are troublesome, and must be met with soot and lime, or ashes, in earthing-up. Canker arises from a damp unsuitable soil, and the remedy for such a state of things is well known. Hollow stalks may arise from more than one cause. I believe "breed" has something to do with it. Get a good strain of a good kind, and be careful about saving seeds, though the way in which the plants have been grown from the first has much influence upon this matter. In short it is partly a question of breed and kind—partly a question of culture, and the greatest prominence should, of course, be given to the last item, as that is, in a measure, in our own hands. The quality of the manure is important—more so than is often thought. It should not be rank or too forcing, and the soil should be kept steadily and fairly moist.

The Turnip-rooted Celery.—For cooking this is excellent. The seeds are sown in spring; the plants, when small, are treated like the common Celery, and when large enough transplanted into shallow trenches which have been manured as for ordinary Celery, though they need not be so deep or wide, and of course the rows need not be so far apart— $2\frac{1}{2}$ to 3 feet will be ample. The plants do not make so many leaves as the ordinary Celery, neither are they so long, for their strength seems arrested by the Turnip-shaped solid mass situated just above the roots, which is the edible portion, though in times of scarcity the leaves may be available for flavouring soups, etc. When full grown, the plants should be earthed-up in the usual way. The earthing-up is, perhaps, a matter of taste. Some cooks think it adds to the delicacy of flavour.

The Leek.—When well grown the Leek is a very valuable vegetable. In the North, where it receives more attention, it is in

high repute. It is very hardy, especially in its earliest stages. When fully grown, highly fed, and blanched to the condition fit for use, severe frosts should be kept from the plants by placing dry Fern or litter over the rows. Some growers shorten the tops—*i.e.* cut off the ends of the leaves at intervals of a month or so, with the view of giving increased size to the stems or necks of the plants. It is very seldom attacked by insects, and is subject to no disease—at least, I have met with none of an injurious character. The Leek is a very strong-rooting plant, and this feeding power should be utilised to the utmost; it should be planted in very deep, rich soil. Some people think any odd waste corner will do to raise Leeks on, but this is a mistake.

SOWING THE SEEDS.—Early in March is time enough to sow in the open ground, which may either be done broadcast or in drills. I prefer the latter plan; but in either case sow thinly, and transplant as soon as large enough, before the plants receive any check from overcrowding. The enthusiastic grower sometimes sows the seeds in a pot or box, and starts them in a frame to get the plants on early for the shows, as size and weight, when accompanied by the finish which time gives, will win the prizes. If the seeds are soaked for twelve hours in lukewarm water they will grow much quicker. This, in fact, gives us nearly as much advantage in point of earliness as placing in a warm frame. Seeds whose germination has been hastened must be placed in a comfortable bed. Scatter thinly and with care when the land is in a fine tilth, and cover with some rich, sifted compost about a quarter of an inch in depth.

TRANSPLANTING should take place as soon as the plants are large enough. Plant in rows from 12 to 18 inches or more apart, according to the purpose for which they are required, and the season. If sown early for exhibition, 2 feet between the rows may not be too much, to allow the necessary space for earthing-up; but the late-sown plants will not require so much room. The land must be in fine condition. Leeks may succeed any crop which can be cleared off in time for the ground to be manured and trenched-up not later than the first week in March. The Onions delight in a firm soil, but, provided it be rich and deep, it cannot well be too loose for Leeks. I have planted them sometimes by making a good-sized hole with a dibble, placing the roots in the hole, pushing a few crumbs of earth in first to cover them, and then leaving them loosely standing in the hole without applying any pressure to the stems. From natural causes, the earth, of course, will consolidate; but when the soil has a tendency to get hard a frequent loosening-up is very beneficial if large Leeks are wanted. Where the soil is

poor it is a good plan to open trenches about the width of the spade, and a foot deep, placing in the bottom a good layer of thoroughly-decayed manure ; mix it up with the earth, and plant the Leeks along the centre of the trench. The rows should be from 18 inches to 2 feet apart. As they advance a little in growth a small portion of the soil from the sides of the trenches may be broken down at intervals to enclose the stems, for the purpose of blanching them, as first-class Leeks should have the whiteness of ivory, and at the same time be firm and compact, and possess great length and size of stem.

LIQUID MANURE may, with advantage, be given during the growing season in dry weather until the final earthing has been given. When planted on the surface, the earth to blanch with will be taken from between the rows with a hoe ; but when planted in trenches the plants will be deeper in the land, and the earth taken out of the trenches will be used for blanching. Leeks are always ready for use when well blanched, whether full grown or not ; and until they push up their flower stems in spring they retain their condition. In winter, just before severe frost sets in, a few dozens should be lifted, and laid in closely together where they can be sheltered, and at the same time easily reached.

VARIETIES.—The Lyon and Ayton Castle Giant for exhibition ; the Musselburgh is a good hardy Leek for general culture.

Shallots.—In the majority of situations these are best planted in February, or early in March. Select an open position, where the land has been manured and deeply worked in winter, and the surface ridged up roughly to expose and sweeten it. A fortnight before planting fork the ridges down, and leave the surface to dry and become pulverised. Plant when the ground is dry, treading it once over to firm it ; then rake smooth, and plant in rows by pressing the bulblets into the ground, leaving the neck and upper part of the bulb exposed. The rows should be 12 inches apart, and the bulbs 6 inches apart in the rows. It is a good plan to prepare a heap of compost in the general clearing-up of the compost yard for covering seeds, or anything which may require such help. It may consist of the charred heap of refuse, mixed with the old potting soil, and a little old manure. This is all blended together, protected from heavy rains, and passed through a $\frac{1}{2}$ -inch sieve, to take out all bits of unburnt wood, stones, etc. In the case of the Shallots a handful is placed over each bulb, forming at first a slight mound. It helps to fasten the bulbs in the ground by its weight, and by the time the young green shoots break through it is crumbling away, and gradually settles down, forming an excellent and nourishing mulch round the cluster of bulbs, adding much to

the health and vigour of the plant, and, consequently, to the weight and bulk of the crop.

After the planting is finished Shallots will very nearly take care of themselves ; but weeds, of course, must be kept down either by hoeing or weeding, or both. In July, when the growth is finished and the tops are dying down, pull up the bulbs and lay them in the sunshine on a hard surface, turning them over occasionally till fully dry and ripened, and then store them away on the shelves of a dry cool storeroom or shed.

VARIETIES.—There are several ; but one known as the Jersey Shallot is the largest and freest from mildew and other forms of disease. Sometimes this kind produces seeds, which, when sown in spring, like Onions, produce good bulbs the same year.

Garlic.—French cooks use this for flavouring, but their English *confrères* seldom ask for it. It is easily grown when treated as the Shallot. Plant small cloves in rows 12 inches apart and 6 inches from each other in the rows. Press the bulblets into the soil, and cover with a little compost. When the leaves die down take up the bulbs, dry them, and hang in bunches in an open airy shed.

CHAPTER XIX

The Turnip.—Turnips, like Carrots, are nearly always in request for flavouring, but, of course, the autumn is the time they are at their best ; the long cool nights of autumn give rapidity to the growth and tenderness to the flesh. The site for the first sowing should be warm and sheltered, but not in the full blaze of the sun on the south border. An eastern or western aspect will be better. Though not commonly forced, the Turnip is amenable to forcing, and may be helped forward under glass on a bed of leaves on which 6 or 8 inches of soil has been placed. Another way of helping the early crop of Turnips is to dig a wide trench and fill it with warm manure, place 6 inches of nice light soil over it, sow the seeds broadcast, and thin out to 6 inches apart. The Strap-leaved Stone is a good variety for this work. Wherever Turnips are forced, if glass cannot be had, a covering of some kind should be used on cold nights. Canvas screens, or covers made of oiled calico, will do. Covers made of reeds or straw are cheap, and if taken care of are durable. I have had some in use for several years, and they do not cost much to make or renew.

SMALL SOWINGS AND OFTEN should be the rule till June. Through March, April, and May, a few seeds sown once in three

weeks or so, if rightly cared for, will give a supply. The land must be in good condition both as to manure and tilth. In some situations early in the season Turnips are a difficult crop to get established, and under such circumstances the culture and treatment cannot be too liberal. It is always best to rush the crop over the bad time by the use of stimulants in the shape of artificial manure. In districts where the fly has been troublesome I have used superphosphate with advantage, and in a dry time I have soaked the drills with liquid manure made from guano and salt. In cases where the crop had been frequently destroyed by fly it gave a remarkably vigorous plant, with great freedom from the fly's depredations. In a general way I like to sow in drills, as it gives such facilities for hoeing. Stirring the surface between the plants is a great help. Kicking up a dust with the hoe when the flies or beetles are hovering round very often serves to banish them to some other garden or field. The May and June sowings should be made in the coolest situation available; but in July sow in an open exposed place for autumn and early-winter use, and in August to obtain nice little Turnips to stand the winter. The first or second week in August is as late as they can be sown usefully. Thin the early crops to 6 inches. Later on increase the distance apart to 12 or 15 inches, which need not be exceeded for garden Turnips, as they do not require to be very large.

PRESERVING THEM IN WINTER.—A full-grown Turnip is more susceptible to injury from frost than a smaller bulb; therefore, when frost sets in, if we want Turnips in a good fresh condition, we must either cover them with leaves or litter on the ground, or take up the roots and clamp them, as is done with Potatoes. It is always a good plan to take up a part of the crop and preserve the roots in this way:—Some may be packed away in a cool place in the cellar or Potato store, the top being first cut off to within half an inch of the crown of the bulb. Sometimes the plan adopted in the field may be usefully employed in the garden. A deep drill is drawn or opened with a spade, and the roots placed in with their leaves only above ground, the earth closing in over the bulb. Except in very severe winters this keeps them safe, and there is no deterioration of flavour, which there must necessarily be when fresh vegetables of any kind are packed up in a heap, for when massed together they will always ferment.

INSECTS AND DISEASES.—The fly is the most troublesome, and the best antidote is to sow on fresh land. Do it well as regards securing a good tilth, and help the plant over the bad time with artificial manures, which should be sown in the drill either in a liquid form or dry, according to times and seasons. Dustings of

lime, soot, and wood-ashes, given early in the morning before the dew is dissipated are beneficial ; and frequent hoeings are, perhaps, equal to anything in scattering and banishing the foe. There is a caterpillar which attacks the young plants in summer by severing the main root, so that the plant perishes. This caterpillar attacks other plants in the same way when young, eating through the root stems and giving a sudden termination to the life of the plant. The best—in fact, the only—remedy is to find and destroy the enemy by keeping a sharp look-out over every plant, and when any flagging takes place clear away the earth and find the caterpillar before he has left the spot. “Ambury, or Finger and Toes,” is produced by the puncture of an insect, its eggs being deposited in the wound. Change of soil is the best remedy. There is no doubt, I think, that the best flavoured Turnips are obtained from the open field, where they are brought under a regular rotation. In Norfolk, a Turnip-growing county, I always liked the field Turnips better than those grown in the garden.

VARIETIES.—The white Dutch and the Strap-leaved Stone are best for forcing and very early sowing. Veitch's red Globe is an excellent main-crop sort. Cattell's Silver Ball and Jersey Navet are excellent varieties. For winter sowing the Golden Stone and Chirk Castle Blackstone are very hardy.

CHAPTER XX

The Carrot.—In the Villa Garden it is often more convenient to obtain a constant succession of sweet young roots than to grow a lot of large ones to store for winter. In a general way, Carrots, for a winter supply, can be bought cheaper in autumn than they can be grown ; and, being fresh from the fields, are usually of better quality than if grown in a highly-manured garden. The best kind of soil for Carrots is a sandy loam in good condition, without fresh manure. Soot, lime, and salt in moderate quantities are excellent dressings for it, and they may be given in February or March. Those who want large roots of the intermediate and other kinds in field culture sow about the middle of March, sometimes earlier. It is true that some of them will bolt, but plenty of seeds are sown, and the general crop is larger when sown in March than in April. The earliest crop in a long succession of young Carrots which I have just spoken of, will be forced in a frame and slight hotbed ; the second will be sown on a warm south border, towards the end of January, or as soon after as the land can be got into suitable condition. These two sowings should

consist of early French Horn. The crop in the frame will be sown broadcast or in drills from 4 to 6 inches apart, and be thinned out, if sown broadcast, to 2 inches apart; or, if in drills, to 1 inch apart, as soon as they are so large that the strongest plants can be distinguished. The young forced Carrots are large enough to use for soups, etc., when quite small, and by drawing out the largest the smaller ones have more space to grow in. The same remarks apply to the first crop on the early border. A further sowing of early Horn Carrots may be made towards the end of February. This time the Nantes Horn should be selected, and that may be sown again about the end of April, again in June, and again about the end of July. The last sown will stand the winter in the open bed with some dry litter to protect from frost—the litter to be placed on just as the frost sets in. It will thus be seen that

A SUCCESSION OF CARROTS may be kept up without difficulty from repeated sowings of Early Horn, and especially do I recommend this plan where the Carrot grub is troublesome. When we place our reliance upon one main crop in a garden subject to maggot, the roots are nearly always useless before the winter is over; but with a bed of young Horn sown in July, the roots drawn from the bed as required are sweet and good till the young crop is getting large enough for use in the frame; in fact, there is no difficulty in bridging the season over with young Horn Carrots. But where there must be a

MAIN CROP the seeds should be sown in April, early or late in the month, according to the season and the condition of the land. Nowadays most of the large seed-houses dress the beards off the seed, so that Carrot seeds are as easily distributed as Onion or any other seeds. I prefer to sow them direct from the bag, with no preparation at all, for, if the soil is right, good seeds will soon germinate. Sow in drills from 12 to 15 inches apart, and, as soon as the rows can be seen, run the Dutch hoe between to stir up the soil and kill the weeds when small (this is the only satisfactory way of killing them). The stirring of the surface should be repeated frequently, so that not a single weed gets a chance to become established.

THINNING THE CROP should be commenced when the plants are about an inch high by drawing a 4-inch hoe through the drills at frequent intervals, so as to leave the plants in little patches from 4 to 6 inches apart. In the course of time these patches should be thinned to one plant, leaving, of course, the strongest; but this singling should not be done at the same time that the hoeing-out occurs—it would chill and check the young plants too

much. The after-culture is almost *nil*, as the tops of the plants soon cover all the land and keep down the weeds.

LIFTING AND STORING.—This usually takes place in October; the roots are pulled—the tops cut off within half an inch or so of the crown—and packed in sand in the root shed. A portion of the crop may with advantage be stored in the open air in the same way as Mangolds and Potatoes—covered with straw and soil. A few good

CARROTS FOR EXHIBITION, when the soil is naturally unsuitable, may be obtained by making holes 15 inches deep and 5 or 6 inches in diameter at the surface with a crowbar, in rows 15 inches apart and 8 inches apart in the rows. These holes are filled with sandy loam, with which some wood-ashes and a small proportion of some artificial manure have been blended. When the holes are filled with the compost, drop four or five seeds into the centre, and cover lightly. The usual routine of culture will be all that is necessary afterwards.

VARIETIES.—For early work the early French Horn is best. This is a small stumpy Horn Carrot which turns in very quickly, and therefore is valuable for the first sowing, either in the frame or in the open air. The early Nantes Horn is a good variety for later sowings, and the Scarlet Horn is valuable for its brilliant colour. The Carentan Scarlet is a rather small delicately-shaped and good-flavoured variety without core. The scarlet Intermediate is an excellent Carrot for general use, and the Altringham is also good.

DISEASES AND INSECTS.—The Carrot is exposed to a good many vicissitudes of weather, insects, etc., from the very beginning till the close of its career. The young delicate plant, even before its infant shoot emerges from the ground, often falls a prey to devouring slugs and other insects, especially in badly-cultivated soil. Frequent stirring of the surface, and an occasional sprinkling of lime and soot when anything of the kind is feared, will be of great advantage. The maggot which attacks the roots towards the end of the season—at least their presence becomes more manifest then—is a great pest in some gardens, and one difficult to deal with effectually. Nothing has hitherto been suggested more effectual than a mixture of salt, soot, and lime—56 pounds of salt, 3 bushels of lime, and 3 bushels of soot, the whole to be laid in a heap in a shed and turned over till well mixed, and then left for a month before being used. This will be enough for a bed four rods or perches in extent. The soot and lime may be increased in bulk if desired, but no more salt should be used. It should be applied to the land in February, and be lightly forked in. Paraffin oil has

been recommended at the rate of half a pint of oil to 16 gallons of water, the plants to be watered with it. The difficulty of mixing the oil with the water may be urged against it, but the remedy is worth trying. The water must be frequently stirred before being applied, and the watering should be done either through a coarse syringe or a rosed waterpot.

CHAPTER XXI

The Cucumber under Glass.—The cheapening of glass has, during the last thirty years, given an immense impetus to the cultivation of Cucumbers. Those not much past the meridian of life can remember the time when Cucumbers were chiefly grown in the dung-pit or frame, and in winter were almost unknown. Now a Cucumber-house forms a necessary structure in even moderately-sized private gardens, and immense establishments, from which fortunes have been made, have sprung up, not only in the neighbourhood of London, but in many other places about the country. I have been told that some of our large Cucumber-growers have found openings for their produce on the Continent, and that—at least so far as regards forced produce—the English grower can do something more than hold his own in competition with the foreigner.

RAISING THE PLANTS.—In a suitable place Cucumbers are very easily rooted from cuttings, and when many plants are required of a kind, such as the Telegraph, which does not seed freely, this is a good way of raising them. Strong healthy cuttings are a necessity ; for weakly plants are not of much use and never attain to a long, healthy, vigorous life. The cuttings may be laid in a bed of warm, moist, light soil, and as soon as the roots are half an inch long, take them carefully out of the soil and pot them. Grow them on till well established or till the house is ready to receive them. If raised from seeds they should be sown or planted in small pots, one seed in each, in light soil, the pots being plunged in a hotbed near the glass. When the seeds have germinated and the plants advanced to the rough-leaf stage, they may either be potted on, or, if the house is ready, planted out. In all cases it is important that the plants should never experience any check in their early life.

TIME TO PLANT.—In a well-constructed Cucumber-house, whether it be a lean-to or a span-roof structure (the latter is the best), a start may be made at any time that suits the convenience of the cultivator, he being governed by his necessities as regards

demand. To have Cucumbers in winter, the seeds or cuttings should be planted early in September, and taken on steadily ; but if we do not require to cut, say, before Easter, we need not begin before December. The treatment of

WINTER CUCUMBERS is somewhat different from that required by summer Cucumbers, and more care and skill are requisite to bring them to a successful issue. When the plants are intended for winter bearing—to begin, say, in November or earlier—they should be taken on steadily without any stopping till the end of the rafter or the top of the trellis is reached, when the leader is pinched out. This extension without stopping adds much to the strength of the plants, and the reserve force is of great value before the winter is out. As much of the pruning as is possible should be done with the finger and thumb, and the knife used only to cut the fruits. Something may be done to keep the growth thin by rubbing off those buds not required to form shoots. Other shoots should have the centre bud nipped out as soon as the fruit is shown. Thin training should be followed out, and only a limited number of fruit left on the plants in the short days of winter.

TEMPERATURE.—The bottom-heat should range from 70° to 75°, but should not exceed the last-named figure. The night temperature of the house should be about 65°. A few degrees higher in mild weather and a few lower when sharp frost sets in will do no harm. The day temperature may vary from 70° in the morning to 85° or 90° or more in the afternoon when the house is saturated with water. The questions of ventilation and moisture are very closely linked together. It is certain that no house is altogether air-tight, and that very often Cucumbers get more air than they need if the water supply is abundant. To forward the crop rapidly—Cucumbers should be grown quickly—keep the house close and use plenty of moisture. Shade will not be necessary in winter, nor much in summer, if the condition as to moisture is suitable. Not only must the border be kept moist, but the atmosphere of the house must be charged with moisture also, and, with a house full of vapour, the leaves will not scorch or burn. In private gardens Cucumber-houses are usually small, but of late years very large houses have been built by market gardeners. Near large towns, where stable manure is plentiful, the bottom-heat is frequently supplied from that source. Small houses are, except in one particular, a disadvantage. The plants in them are more subject to insect attacks, there is greater difficulty in keeping the atmospheric moisture at the right point, and the ventilation is consequently more difficult to manage. In small low houses fruit may be cut a little earlier at a less cost for fuel ; but in large

houses, with abundant light and moisture, very little ventilation will be needed beyond what is obtained by filtration through the laps or other permanent openings. As regards

SOIL, simple things are best. Two-thirds turfy loam with one-third old manure, will do well. I have found an advantage in giving a pound of Amies' manure to each bushel of soil, mixing all together thoroughly. Whatever the arrangements for bottom-heat may be, if it is supplied by pipes laid in rubble it will be an advantage to have a foot or so of fermenting materials on the top of the rubble, if there is room enough. I am not sure that I require to enter into the why or wherefore of this, but I have proved its efficacy often, and must recommend it. Cucumbers do not require a great bulk of soil to grow in at first, but they must have frequent light top-dressings after they get fairly into work, and the soil used for this purpose should have the chill taken off before coming into contact with the roots.

LIQUID AND ARTIFICIAL MANURES.—These must always play an important part in Cucumber-growing, and the two may mean one and the same thing. If a good supply of liquid manure should be at hand in any wholesome form, whether drainage from a farm-yard or house sewage, artificial manure may perhaps not be needed; still, plants like a change of diet sometimes, and I have used artificials with advantage even when I had plenty of liquid manure in the tank.

IN THE FRAME the Cucumber has long been grown, and though a considerable amount of skill is brought to bear upon its culture early in the season, I never remember to have cut Cucumbers out of a frame before March. It used to be thought very good work to cut any time in March with nothing beyond a dungbed for top and bottom heat. Unless there is a warm house to raise the plants in, a hotbed for the purpose should be made up early in the year. This may be of smaller dimensions than will be required to plant in later on. A one-light frame will be large enough for a seedbed. The blending and mixing of the materials in the formation of the hotbed is a work requiring some judgment and experience, for, unless this is properly done, the bed will either be too hot or too cold, and the whole thing, for the time being at least, involved in ruin. To make a bed for Cucumbers in January a considerable bulk of materials will be required. The bed when built should not be less than 5 feet high at back and 4 feet at front, and at least a foot wider on all sides than the frames. The best materials for hotbeds are about equal parts of Oak leaves and stable manure. With these the heat will be steady and lasting, both qualities being essential to success. The materials should be wheeled or carted to

the site of the bed, which should occupy a sheltered position, as the wind is very detrimental to steady heating. The whole should be shaken and mixed together, and when warm, in the course of a week or so, it should be turned over, throwing the outsides into the middle, and watering any dry spot which may show itself. In the course of another week the bed may be made up, applying just the requisite amount of pressure as the bed is built up to ensure regular steady warmth. Without air there can, of course, be no fermentation, and consequently no warmth; but unless sufficient pressure is applied to drive out some of the air the heat will be more than is required, and the heat-giving properties of the materials will be unduly and prematurely exhausted. There is a certain amount of heat in a given bulk of material, and it is in so regulating this by pressure as to produce the requisite warmth in the bed that the skill of the operator shows itself. Linings can be added when necessary to keep up the temperature. As regards raising the plants, the same treatment as recommended for raising plants for house-planting will be necessary. Plant in light soil, one seed in each small pot, and plunge the pots in the bed, guarding them from mice and insect attacks. When the young plants appear above ground the beds should be built up to receive them, and as soon as the heat is regular and steady plant out in hills of warm soil placed in the middle of each light. Everything about the frames should be clean and sweet. If the frames have not been painted they should be washed with soap and water, and the lights also should be cleaned, so that a maximum of light may be admitted. It is comparatively easy to tell when the bed is fit to receive the plants. Some people who desire to be exact insert a thermometer just within the bed, inside the frame. When the temperature drops to 80° or so the hills are placed within, and in a day or two the plants are turned out. If the moisture which condenses upon the glass and hangs in drops from the sash-bars of the lights is clear and colourless, the bed is sweet and free from noxious gases, and generally the plants will be safe. Practical gardeners do not often use thermometers to denote the temperature of a hotbed; most of them thrust in a stick a considerable depth, drawing it out occasionally to test its warmth by holding the warm end in the hand for a few seconds, and as soon as the heat declines to a nice comfortable warmth the bed is safe for the plants. The longer the building of the bed is delayed the less care will be needed, as beds made up in February or March will not run so many risks as those done earlier in the year. The application of

TOP-DRESSINGS will be as necessary in frame as in house-culture; and liquid manure, after bearing commences, is also quite as neces-

sary. The pinching at the first leaf beyond the fruit must be observed, as a thicket of growth is an evil, though in the summer culture of Cucumbers the knife inspires less dread in the mind of the observant cultivators. Some growers go through their Cucumber frames once a week to regulate the growth, and pinch and prune when needful, scattering at the same time a little rich compost over the white roots which come to the surface to look for more food. Atmospheric moisture will be supplied by sprinklings on sunny days with the syringe or the rosed waterpot, always using water of the temperature of the frame, and shutting up immediately the sprinkling is done, to bottle up, as it were, the sun's rays, which are far superior to any other kind of warmth.

INSECTS, DISEASES, ETC.—The red spider is the most troublesome pest. Green-fly can be easily got rid of by two or three gentle fumigations; but if the red spider only gets a footing he will be difficult to deal with. It is much easier to keep the red spider out of the house or frame than to turn him out when he has become established. He dislikes moisture, and delights in dry warmth. Hence, knowing the conditions under which the spiders live and increase so marvellously, it is the cultivator's own fault if he does not checkmate his enemy. If sufficient moisture is employed in the atmosphere, and enough water in some form be given to the roots, the red spider does not give much trouble. If the atmosphere is charged with ammonia, the use of a little guano or some such stimulant in the water for sprinkling the borders and floors of the houses or pits will be beneficial in more ways than one. Thrips are sometimes troublesome to Cucumbers, especially early in the season, but these may be easily destroyed by fumigating with Tobacco. These are the chief insect-pests which attack Cucumbers seriously, and the red spider is the worst of the three. I have cleared plants from them by shutting the house up close night and day, for three or four days, and thoroughly saturating the atmosphere with moisture, shading a little during the hottest part of the day. The insects also dislike the fumes of sulphur; but in all cases of attack promptitude is everything. When the leaves are destroyed it may be a satisfaction to kill the enemy who has done the mischief, but it will not bring back the dead to life. The chief disease which gives trouble to Cucumber-growers is gumming or gangrene, its chief seat being in the fruit, which it quite spoils. This is so difficult to cure that on its first appearance most cultivators try to stamp it out by destroying the plants, clearing out everything from the house, and starting again with the whole fresh and clean. Gangrene often attacks plants which have been checked and starved by injudicious treatment, though occasionally well-

managed plants fall a prey to it. Increase of temperature, accompanied by abundant moisture in the atmosphere, has been known to banish the disease or to keep it at bay for a time till a new set of plants could be started.

VARIETIES.—Telegraph is the best all-round Cucumber. Carter's Model and Tender and True are also both excellent; there is nothing gained by growing more than three good kinds.

CHAPTER XXII

The Cucumber in the Open Air.—In warm sheltered situations, where the soil is rich and light, Cucumbers, if the right variety is obtained, will succeed very well in the open air in the summer months. A site open to the south, but sheltered from the north and east, is the most suitable. The seeds should be sown in small pots, three in each, be lightly covered with light rich soil about the 10th of April, and placed in a frame near the glass, where there is a gentle hotbed. In due course the plants must be moved to a cold frame to harden off, to be ready to plant out about the 20th of May if there are handlights to shelter them, or the end of the month if they cannot be specially attended to. It is always easy enough to improvise some shelter for a few nights if the weather should become unsettled after the plants are out. Flower-pots inverted, put over them at night, will keep them safe, and evergreen branches will afford a good deal of protection. I have used frames made of wire in the shape of handlights, and covered with oiled calico; they are very effective, and if taken care of last a long time. The hills should be got ready a week or so before the plants are ready to go out. Set them out in rows 5 feet apart and 4 feet apart in the rows. A little more space may be allowed when the position is a very favourable one, but for the most part the distance named will suffice. In preparing the hills dig out a hole that will hold a barrowful of stable manure, and on the manure in each hill place half a barrowful of turfy loam and old manure in about equal parts to set the plants in. If the natural soil is very good this trouble need not be taken. Still, anything that gives encouragement in the early stages of the plant's existence will not be labour lost.

MULCHING AND WATERING.—As soon as the plants begin to run freely the spaces between the hills must be mulched with rather long manure, turning the shoots back on each side to allow the stuff to be placed close up to the plants. If handglasses are used, as the season advances they will be set upon bricks, until

they can be removed with safety, and the plants encouraged to run out, the shoots being pegged down to keep them steady and prevent the winds injuring them. Watering is a necessity, and must receive careful attention, and, as soon as the plants begin to bear, liquid manure should be given. Go over the plants twice a-week, and cut all fruits fit for use. To leave them longer would lead to exhaustion and, perhaps, premature death.

Gherkins for Pickling should be cut when small or they will be useless. In other respects the treatment they require is the same as that given to Ridge Cucumbers generally.

VARIETIES.—It is rather difficult to get seeds of a really good Ridge Cucumber. Those who have the best varieties (and they are in the hands of market-growers chiefly) do not care to part with seeds. There is no difficulty in obtaining seeds of the usual short prickly varieties, but these are not what I mean. A Ridge Cucumber that will produce in the open air, in August and September, fruit from 10 to 12 inches long, fit for table use, will be valuable.

SAVING SEEDS.—When a good variety has been secured it will be advisable to save seeds, and one or more hills should be set apart for that purpose, leaving four or five of the handsomest fruit early in the season of bearing, and before the plants have become exhausted. When the fruits are ripe and are changing colour cut them from the plants, and place them on a shelf in a cool airy room to complete their ripening; then the seeds should be taken out, washed from the pulp, dried thoroughly, and packed away in a drawer. When kept in a dry place Cucumber seeds retain their vitality a long time,—how long I am not prepared to say, but certainly more than twenty years.

Salsafy and Scorzonera.—I have linked these plants together because they require the same treatment and somewhat resemble each other. The Salsafy is called the Vegetable Oyster, because when cooked its flavour has something of that delicious bivalve about it. It has a white root, from 8 to 12 inches long, and, when well grown, from three-quarters of an inch to an inch in diameter. The roots are very apt to fork out; therefore they should be grown on good land, but without manure, or, if manure is used, it should be buried at least 12 inches deep. The seeds should be sown in March—towards the end of the month or the beginning of April will do in late districts. If sown too early, some of the plants may bolt, and then the roots will be tough and useless. The seeds should be sown in drills half an inch deep and from 12 to 15 inches apart. When the young plants are 2 inches high, thin to 6 inches apart, and hoe frequently to keep down

weeds through the summer. The roots will be fit for use when large enough. They keep best in the ground till required for use, but should be lifted in March before growth begins, and packed in earth or sand in a cool place. The *Scorzonera* has a darker-coloured root, and is less likely to fork out, otherwise there is but little difference in the treatment required. It should be sown at the same time as the *Salsafy* and receive as much space.

THE CHINESE YAM.—The Chinese Yam differs from most other kinds in having a much longer root. When it was introduced it was much puffed up, and the seedsmen made a good thing of it. Like many others, I cultivated it, because at that time (about thirty years ago) it was thought it might prove a substitute for the Potato, which was looked upon as being doomed. A very few years served to satisfy most people that the Chinese Yam could never become a substitute for the Potato, though it might be grown as a fancy dish for a change. I took a great deal of pains with its culture, and raised some very large, very ugly roots; but the housekeeper was the only person who cared for them, and so their cultivation dwindled away. I tried hard to induce others as well as myself to like them; but the “*praties*” beat them out of the garden as they had previously done out of the field. Nevertheless, to those who do like them, they are a nourishing article of diet, and may be easily cultivated. As the ground for them must be deeply worked, they will form good preparatory crops for Onions, Peas, Beans, Cauliflowers, etc. The land should be thrown into ridges 3 feet apart during winter, and well manured. Plant the sets along the top of the ridge, 15 inches apart, early in April; and place some Pea sticks for the growth to climb up, as the support given to the haulm adds to the growth of the tubers. Unless the soil is very rich and deep the roots had better remain two years in the ground before they are lifted for use. As they run down very deep, they must be carefully trenched out. They do not keep well out of the ground, and when lifted for use should be packed in earth or sand in a cool cellar, or buried in a cool shady spot, with a good thickness of soil over them. The roots not only run down deep, but are largest at the bottom, and this adds to the difficulty of lifting them. The small upper parts of the tubers should be preserved to cut into sets for planting. It may be advisable to start the sets in pots and plant out when the buds are starting; this will prevent any blanks appearing in the rows.

CHAPTER XXIII

SALAD PLANTS

The Lettuce.—A poorly-grown Lettuce, no matter how manipulated, does not make a good salad, for its thin leathery leaves cannot have the crispness and succulency of the plant grown on deep rich soil. Very good Lettuces are generally obtained from the crowns of the ridges between the rows of Celery. They are planted one row on each ridge, 13 inches apart for the large kinds, and 10 inches for the small Cabbage varieties such as Tom Thumb. The land for Lettuce should be loose and friable, for unless grown quickly they are likely to be tough and bitter; therefore, no matter where planted or sown, the land should have been recently stirred either by fork or spade, and the manure must not be stinted. West or north borders may with advantage be used for Lettuces during hot weather in summer; and some at least of the plants should remain where sown without transplanting, as the fewer checks given during the last half of June and the whole of July the better. In planting Lettuces lay a board across the bed or border for the planter to walk upon. I generally transplant a few of the thinnings even in the hottest weather—for I keep a cool border in reserve for such work, and by watering it well the evening before, and shading the plants with a few branches immediately after planting, they start away directly and grow very fast. Quick growth in summer is essential to crispness.

TO OBTAIN A SUCCESSION frequent sowings are necessary from March till the middle of July. As soon as the last-sown plants are fairly up sow again; the amount of space to be occupied will be in proportion to the demand likely to arise, and a liberal allowance should be made. The seeds are very often sown broadcast; but I prefer to sow in drills, as it is so easy to stir and clean the surface-soil when the plants are in rows. The seeds are small, and the drills need not be more than half an inch deep; a well pulverised soil is necessary. Where the soil is heavy and steely when dry, some leaf-mould worked into the surface with the rake just before the seeds are sown will be a great help; and as it is important that the successional sowings should be made in due order, the seedbed should in dry weather be thoroughly soaked three or four hours before sowing the seeds,

and well worked with fork or rake to get it thoroughly inter-mixed. Shade with branches or Rhubarb leaves, or mats laid on the ground till the seeds germinate. A covering of manure 3 inches thick between the rows of Lettuce will do more good than watering, even if it be done daily. The mulch should be placed on early in the life of the plants if the summer is hot and dry, so that it may settle down and some of the nutriment be extracted from it for the use of the crop just at the time it is needed. All Lettuces are the better for being tied up for a few days. The work of even those which naturally fold their hearts up closely is done all the better by having the leaves drawn up a little round the heart. Cabbage Lettuces should form no exception to this rule.

SOWING FOR AUTUMN AND WINTER.—This should take place about the middle of July, and again in the first and third weeks of August. The plants raised in July should be planted in any nice open situation that has been well cultivated. If slugs or snails have been troublesome to previous crops, the ground should have a dressing of soot and lime. Make the first August sowing on a ridge with a southern exposure or else on a warm south border. A portion of the plants raised at the last sowing should remain in the seedbed all the winter. One part should be planted out in a sheltered corner, and another in a frame; and if there is an Orchard-house, some may be planted in a light position there, or potted in 5-inch pots and grown on a shelf near the glass. As regards their culture in frames, where Melons are grown on dungbeds they will all be cleared out by September, as a rule; and, if the soil is turned over and a little fresh loam and leaf-mould added, the young Lettuces may be planted out in the bed towards the end of October. The best Lettuces for winter are Tom Thumb Cabbage, Black-seeded Bath Cos, and Hick's Hardy White Cos. They are hardy in constitution and not so liable to suffer from damp and mildew as others are. If the soil is not near enough to the glass—say, within a foot—it should be raised. As the space is valuable the most should be made of it, and I find that the best way to do this is to plant the Brown Cos and Tom Thumb Cabbage alternately, the former 12 inches apart, and the Tom Thumb in the centre of the spaces between the Cos; the Tom Thumb will turn in, and be used before the Cos requires all the space. The soil should be in a nice moist condition when the plants are set out, and water given when required, which will not be often in winter, as the frames should be kept nearly closed. All needful ventilation must be given by tilting the lights up a couple of inches at the back.

The object of growing Lettuces in frames is to secure a better climate and get them in early ; and if the atmosphere is sweet and buoyant, whatever warmth the sun creates in winter should be kept in the frame so long as a circulation is kept up. In very severe weather a little Fern or dry litter should be scattered over the glass, as much to keep out the sun as to keep out frost, for the alternate freezing and thawing may do injury.

FORCING LETTUCES.—Some of the best and finest Lettuces I have ever had were sown in a box in January and pricked out in a frame on a slight hotbed of leaves and dung in February. The best kinds for this work are the Paris Market Cabbage and Paris White Cos. The former is rather larger than Tom Thumb, but not so hardy in constitution ; its growth is faster where the conditions are suitable, and better adapted for forcing than that variety. The Paris Cos is also an excellent early kind, of good size and substance. The two varieties just named are also very suitable for summer culture.

Saving seeds is a very easy matter. We have only to leave a few plants of the kind we wish to save seeds from some time during summer, when there is time for the seeds ripening, cut the pods as they ripen, and lay them in a box or on a tray in an airy building. When the ripening process is completed, dress out the seeds and pack them away in a dry cool place. As for varieties, besides those already named I would add Carter's Giant, White Cos, Kingsholm Cos, Lee's Hardy Green Cabbage, and All the Year Round Cabbage.

Endive.—For autumn and winter salads Endive is indispensable, and, like Lettuces, may also be cooked as a vegetable. In the average English household this is seldom done. The

FIRST SOWINGS should take place about the 1st and the middle of June. If sown earlier Endive is very apt to bolt, and even in June it will be better to sow in drills $\frac{1}{2}$ inch deep and 15 inches apart, and thin the plants to 1 foot, leaving them on the ground where sown without transplanting. Though in many instances and on most soils transplanting may be a benefit, yet, in a dry time, plants which have experienced no check generally stand the best. The soil should be in good condition and of good depth, but immediate contact with a large quantity of manure is not desirable. In the early time it is best to sow often, as, if the earliest sowing fails, the crop raised a week later may be all right. Sow twice in July, and from these sowings the autumn supply will be obtained. In the case of plants raised after the middle of July transplanting will be an advantage, as the roots being more at home, and perhaps nearer the surface, the growth will be more curled, shorter, more compact, and better. Sow twice in August.

The last lot of plants will come in useful in spring if the winter is not too severe, but Endive when unblanched will stand a good deal of frost without injury, and where frames can be spared protection should be given after November. In

SETTING OUT THE PLANTS from the seedbed those intended for summer and autumn use should occupy a nice open position. A piece of ground running through one of the quarters of the garden will suit them better than positions under walls, or near fruit or other trees. The ground should have been forked up deeply, and receive a sufficient dressing of manure or manurial compost. I confess that for Endive I like dressing the land with a sort of *omnium gatherum* compost in preference to manure pure and simple. To get a quick growth for Endive the soil should be well broken and pulverised through all the stages of growth from the seed onwards. A bed 8 or 10 feet wide running across the quarter of the garden furnishes a supply that will last some time—it is not advisable to plant so much land at one time till we are sure the plants will stand; but I think, if treated properly, that all plants raised after the middle of June may be relied on. When the bed is ready take a light board or plank that will just reach across the bed, make a couple of sticks 15 inches long, and keep one at each end to measure with. The board will do as a straight-edge to plant by. A couple of men will put out a large number of plants in a short time, and the ground remains in a nice open condition.

For winter a well-drained situation should be selected—a border sloping to the south being the best. It is a good plan to nip off the ends of the leaves when transplanting, especially if they are long or straggling, as it induces compactness of growth, which is very desirable. The plants for late autumn and early winter use will come from the last July and first August sowing. Cleanly culture, which is included in a frequent stirring of the surface among the growing plants, must at all times be insisted on; and though where the land has been thoroughly prepared water is less necessary, there are times and seasons when a good soaking of water, including some liquid manure, may be of great benefit, the surface being stirred up with the Dutch hoe early the next morning, before the sun has dissipated all the moisture.

THE BLANCHING is a very necessary operation, and should be performed as soon as the plants are large enough. There are several ways of doing this; but no matter how done, whether by covering or by tying up, the plants must be dry before the light and air are excluded. If covered up when damp the hearts or the leaves will decay. The common way of blanching in summer is to

tie up the plants when quite dry and place an inverted flower-pot over each one, with a bit of slate over the hole to keep out damp. Another plan is to lay a broad thin board over the plants in each row without any tying up at all. In the autumn the plants may, after tying up, be covered with dry Fern or Oak leaves, and they will keep good in this condition a long time. As a rule in summer and autumn they are tied up or covered up in batches in succession, as after a time the growth will under any circumstances begin to decay. At the approach of the season, when sharp frost may reasonably be expected, a part of the stock should be lifted and planted in turf pits or frames, or in some place where shelter can be afforded. If tied up when dry, and a ridge of dry ashes formed over them, they will keep in good condition a long time. Sometimes the plants are lifted with balls, and moved to the Mushroom-house for a week or two, as they blanch quickly in such a situation, though they do not keep long. On the whole I do not think there is a much better plan than tying up a lot of plants in November when quite dry, and covering deeply, as they stand on the bed, with dry Fern or Oak leaves. I have seen them keep sound and fresh under such conditions for a couple of months. The atmospheric conditions are not always quite suitable when the plants are taken to frames or the Mushroom-house. They are either too dry and get tough, or too damp and decay sets in. Some of the last-sown plants should be planted in a turf pit where shelter can be given, and a part should be planted on a ridge or bank to come on in the open air in spring.

FORCING.—Though this is not commonly done, there may be places where it is desirable to have it in spring as well as forced Lettuces. A bed made of two-thirds leaves and one-third manure will be best to raise the plants on. As soon as the heat has risen nicely—and with a bed made of such materials it will not get too hot—place on a layer 6 inches thick of nice light rich soil, and sow the seeds thinly broadcast. Thin first of all to 3 inches apart, planting the thinnings to other frames if possible. Later on, as required, thin the plants to 9 inches apart, mulch with some short rich compost, and keep moist.

VARIETIES.—There are two distinct classes of Endive—one has curled leaves, and the other more resembles Lettuces in growth and foliage. Some people think the broad-leaved (Batavian) more crisp and of better flavour than the curled-leaved kinds, but the latter are the most cultivated. *Green-curved varieties*: Digswell Prize and Large Green Curled. *Batavian varieties*: Fraser's Improved and White Lettuce-Leaved.

CHAPTER XXIV

The Beet.—As a salad plant Beetroot possesses considerable value, which the general public are only just discovering. In first-class establishments it has long been cultivated, and ought to find its way into every middle-class household; if known, it would be appreciated in every intelligent cottager's also. The seeds of the Turnip-rooted Beet may be sown about the middle of March for early use, as this variety is large enough for use long before any of the long-rooted kinds are ready, which forms its chief value. The drills should be 15 inches apart, and half an inch deep. Thin the plants out to 8 inches apart; they are fit for use as soon as large enough. I only sow thus in advance to obtain a few early roots for the summer salads. Medium-sized roots are better in all respects than large coarse ones, and to obtain these the main crop should not be sown before the middle or end of April. The soil should be deep and friable, and if it be of a porous nature a dressing of salt will be beneficial. The drills should be from 12 to 15 inches apart, and cover the seeds about half an inch deep. Single out the young plants as soon as large enough, to 8 or 10 inches apart. The land must be kept free from weeds by a frequent use of the hoe, but the skin of the roots is tender and very susceptible of injury from a careless use of the tool. The plants will transplant when young if it should be needful, and some people think the best-shaped roots may be obtained by transplanting; but to secure well-shaped roots the young plants must be carefully lifted, special care being taken not to injure the tap-root either in taking the plants up or in planting them again. If the tap-root does not get a proper insertion in the ground the roots may be malformed.

LIFTING AND STORING.—This must take place before frost comes sharp enough to injure vegetable tissue. It is not generally safe to leave them out unprotected after the middle of October in districts where the autumn frosts are severe. If protected with tree leaves, dry Fern, or dry litter, they will keep in the ground all winter. Some people think they are better flavoured when left in the ground; but if well kept and packed in rather dry sand, in a cool place, there is not much deterioration. The colour seems to be held in very loosely, for it oozes out at the least puncture, and no damage or injury must be done in lifting. The tops may be shortened, but not cut close up to the crowns. The best way is to twist the leaves off with the right hand, and as soon as the

roots are dry pack them away in the store. No roots should be cut or even broken off, as such wounds do not readily heal, and when the roots are cooked the colour comes out at these injured places.

SAVING SEEDS.—Select a few of the best-shaped roots early in March, and plant them 18 inches apart in an open situation. Cut the seed-stems as they approach maturity, and hang them up in an airy room or shed till quite harvested, when the seeds should be thrashed out. If a large quantity is grown it may become necessary to harvest it in the field, by cutting and standing it in clusters, as Turnip and other seeds are done. Very often the seeds are cut and laid in small heaps at intervals, and frequently turned to prevent damp settling on them. Good varieties are—Egyptian Turnip-rooted, for early sowing; and for main crop—Dell's Crimson, Henderson's Pine Apple, Nutting's Select Dwarf Red, and Carter's Perfection of Beets.

Chicory.—This makes a useful salad plant in winter when forced. In good soil it produces roots as large as medium-sized Carrots, and these roots may be either stored away like Carrots or left in the ground till required for forcing. Sow in May in drills 12 inches apart, and thin out to 8 inches in the rows when large enough to single. It is not particular as to soil, though, of course, the finest roots are produced on the best soil. Keep down weeds in summer and autumn. When the roots are full grown, some may be lifted and placed in heat. The roots of Chicory are mostly forced in the Mushroom-house, as light must be excluded, so that the growth which shoots from the crown of the roots as soon as the heat is applied may be blanched and lose some of its bitterness. Where there is a good supply of Endive, Chicory is not much called for; but it is always advisable to grow a few roots, as it makes a nice change in winter and will not disappoint, no matter what the weather may be. It will force in any dark place where a temperature of 60° can be ensured. It may be planted in boxes, having closely-fitting lids, and placed under the stage in a warm greenhouse.

Dandelion.—This, like all other plants, improves under cultivation. The seeds are offered in several of the seedsmen's catalogues that have come through my hands, and those who choose to do so may gather seeds from strong plants growing in the fields or by the wayside, or roots may be collected and planted in spring to get strong; or large roots may be sought for in autumn to force at once in any warm dark place. Sow the seeds thinly, in drills 8 inches apart in March. When the young plants appear, thin to 6 inches apart, and pick off all flowers. If this is not done

the Dandelions will become an annoyance in the garden, from the scattered seeds. In autumn the roots can be lifted and potted, or planted in a warm dark place such as the Mushroom-house. The Dandelion is a valuable salad plant, that would be better appreciated if not so common, and from a medicinal point of view it is valuable. The late supply may be blanched in the open ground by covering the bed with sifted ashes or old tan.

Lamb's Lettuce, or Corn Salad.—Though not much grown in this country, this makes a useful addition to salad plants, especially in winter and spring. In summer, when there are plenty of Lettuces, it would not be so much called for. It should be sown in August, September, and October for winter and spring use, and again in March and April for summer. Sow in beds broadcast, lightly raked in. Unless sown thickly not much thinning will be required, as the largest plants may be cut first and the smaller left to grow on.

CHAPTER XXV

Radishes.—If desired, Radishes may be had nearly all the year round. Make the first sowing in a hotbed in January. Where much vegetable forcing is done the crop is frequently worked in with other things, such as Horn Carrots, Potatoes, Lettuces, etc. The Radishes germinate and turn in quickly, are cleared off, and the whole space is left for the other crops just at the time they need it. At the time this sowing is made under glass, a bed is sown in the open air on the early border and covered with a sprinkling of straw. This covering keeps off birds, shelters from cold, and forwards the germination of the seeds by keeping the soil even in temperature and moisture. As soon as the plants appear the straw must be taken off a few hours every day and replaced again at night until the plants are hardened enough to bear full exposure. If a regular succession of Radishes is required, make fortnightly sowings from March till the end of September. The early sowings should be Wood's frame, but from April through the summer and autumn sow French breakfast and the red and white Turnip Radish. The black Spanish is sometimes sown for winter because of its hardness. For summer use sow on cool shady borders, and make the soil rich. We have some beds of rich loam and leaf-mould that we use in spring to prick bedding and other plants on, and after these are cleared the beds come in for Radishes and other things which may require rather better treatment than can be given in the ordinary soil of the gardens. Unless Radishes be grown quickly, and are

crisp and cool, they are uneatable and useless. It is better to sow in drills, as this permits of frequent surface-stirring, and also leaves space between the rows for a mulch of short manure, which is a great advantage, especially in summer. When the plants come up too thickly, some of the smallest should be thinned out. When young every part of the Radish may be used in the salad bowl, and the later plants, thinned out where too thick, may be washed and used in the mixed salad. In dry weather Radishes must have water, and it should always be given in the evening. To ensure quick germination in hot weather, water the soil thoroughly the day before the seeds are sown, or if sown in drills soak them with liquid manure just before sowing, and cover in with light soil. Cover the beds with mats till the seeds germinate, or shade in some way.

Water-cress.—There are several ways of securing a supply of this wholesome plant. In winter the cuttings may be planted in pans of light rich soil in the greenhouse. The pots or pans should be plunged in Moss, which should be kept damp. A frame which can be kept close if desired will do for its culture in spring and summer, and it may be planted in the open air. In gardens where the water is laid on it will be a very easy matter to make an artificial hollow, and plant it with cuttings of Water-cress, 3 inches or so apart, and turn the water on occasionally as required. After each cutting a little top-dressing of light rich soil will be beneficial. Where cuttings cannot be obtained the plants may be raised from seeds, sown in pots of light soil, placed in a frame, and kept close till germination takes place, when, as soon as large enough to handle, they should be dealt with in the same way as cuttings are.

Rampion.—This plant has a white root like a Radish, which may either be eaten as a Radish or sliced up in the mixed salad. Sow the seeds in May and June. The seeds are like fine dust, and the beds must be carefully prepared and thoroughly pulverised. If sown in drills draw them very shallow, about 5 or 6 inches apart, not more, and cover lightly with very fine soil. If the weather should be dry, water the drills before sowing the seeds. When the plants come up, thin out to 6 inches apart. Water when necessary, and keep clean. It is as well to make two or three sowings during May, June, and July. The first will come into use in autumn, and the others in winter. The roots may be taken up and stored like Turnips in winter, or be covered with dry leaves or Ferns, to keep out frost.

Various Cresses.—The plain-leaved Cress is the one most commonly grown, and it may be sown any time. In winter make weekly sowings under glass. From the first of April to the end of

October sow in the open air. As the leaves are cut in a young state the seeds should be sown thickly. Some cover the seeds lightly with fine sandy soil, but, if kept moist, they will grow on the surface without any covering. I have seen them grown on moist flannel wrapped round a bottle of warm water. The American Cress, which is used as a substitute for Water-cress, should be sown in April and August, and the Golden or Australian Cress in March and April.

Mustard.—This is a most useful salad plant, and as it can only be used in a young state it should be sown weekly where a regular supply is required. Sow it thickly like Cress, and the seeds need not be covered. From November to April sow under glass in heat; and from April to November sow in the open air. The first batches in spring, and the last in autumn, may be sown under handlights.

Horse-radish.—This is usually relegated to some out-of-the-way corner, and left there. I confess that the temptation to do this is very great, for when once into the soil it is only got out with difficulty, and this makes it an awkward plant to fit into any particular rotation. Wherever grown there is no excuse for not starting right, and a comparatively small bed, if well done, will produce a good many sticks, as they are commonly called. On the whole, it pays better to deepen the soil in one particular spot, plant the Horse-radish there, dividing the plot into three parts, trench one part each year, and pick out all large enough for use. In three years' time the pieces left in the bottom of the trench will have formed crowns, and grown large enough for use. The soil should be fairly light, for it is very difficult to dig the Horse-radish out of clay. In the beginning, if the land is not quite right it may be made so by adding ashes; burnt earth or soil may be brought from any other part of the garden to give the requisite depth. Light stuff may be wheeled on the Horse-radish bed any time when it can be obtained, as the crowns will soon push through. In making new plantations, the crowns may be planted a foot deep with a crowbar and the holes filled with light rich soil. Another way is to plant the long straight pieces selected for the purpose when the old plantation is trenched over, and plant them in rows 18 inches apart and 9 inches from each other in the row. Before planting, all small fibrous roots should be rubbed or cut off, as long straight stems without forks are the best. Horse-radish may be planted any time between November and March. The stems or sticks selected for use should be laid in thickly in a cool piece of land, where it can be drawn and used as required.

Kohl Rabi.—Though not generally grown in gardens, it is, as may be inferred from its origin, a wholesome vegetable. As most of my readers know, the Kohl Rabi, or Turnip-rooted Cabbage, is intermediate between the Turnip and Cabbage, both being highly-esteemed vegetables. The seeds may be sown in July towards the end of the month for standing through the winter, or the sowing may be made in spring—in March—in rows 18 inches apart where the plants are to remain, and thin out to 12 or 15 inches apart. The July sowing will probably produce the largest bulbs, but those raised in spring will be most appreciated in the kitchen, as possessing the qualities most esteemed there—viz. tenderness and succulency. The plants raised in July or August should be planted out in spring; they will grow to a large size, and should be allowed more space.

Capsicums and Chillis.—I once had to cater for a gentleman who always had a green Chilli cut up in his soup every evening; and for mixing with and giving tone and flavour to pickles they are often in demand. They should be sown in a warm frame or pit in March, and when large enough to handle should be pricked off either singly into thumb-pots, or three or four plants round the sides of a large 60. Grow them on in heat till well established; harden off in May, and plant out about the end of the month at the foot of a south wall in a sunny corner, 15 inches apart. Mulch between the plants and water when necessary. Some of the plants may be kept in pots, potting them on into larger pots as they require more space. Others may be planted out in a frame from which early vegetables, such as Potatoes, Carrots, etc., have just been cleared. They thrive best in rather a light soil; turfy loam of average quality, enriched with some leaf-mould or old manure, will do them well, and a little of this or similar compost may with advantage be worked round the roots when planting them out. The varieties are now somewhat numerous, including several, such as the Prince and Princess of Wales, which possess considerable decorative merit. The long red, long yellow, and small red Chilli are best for mixing with pickles. When growing in a suitable temperature, and not starved or neglected in the matter of food, they are not much subject to insects or diseases. Green-fly will attack them, and so will red-spider, if they are kept in a starved condition. Tobacco, in the shape of wash, fumigation, or powder, will destroy all forms of aphides, but the syringe is the best implement to bring to bear upon the red spider.

Sorrell.—A few roots of a good variety should be grown in every garden, as most people who have a fair knowledge of good cookery use it for flavouring. It requires no special soil or culture,

and is easily increased by division of the roots in spring, or it may be raised from seeds sown in March or April. Plant either in single rows or in beds from 12 to 15 inches apart. Keep the flower stems cut away, but do not cut all down at once, or the supply will be stopped for a time. It is not necessary to divide the roots every year, though they should not be allowed to stand too long in one situation. If there is a demand for Sorrell in winter, it may easily be forced in pots or boxes in a warm genial temperature. The plants for forcing should be potted or boxed in autumn and sheltered in a cold pit till introduced to the forcing structure, a few at a time as required.

CHAPTER XXVI

Parsley.—I shall have a chapter on herb culture farther on, but I think Parsley is of sufficient importance to be treated separately. Were I asked which is the best time to sow Parsley, I should say, if only one sowing were made, from the middle to the end of July; and if I only sowed Parsley once a-year I should sow at that season in preference to spring, especially in cold backward situations. The advantage of sowing then is that but very few of the plants run to seed the following year, and those few can be pulled up and a good even bed will still be left. In the Villa Garden there should be a place for everything, and everything should be in its place. Parsley should be sown in some easily accessible spot. The soil should be deep, and the site well drained, especially for winter use. It is best to sow in drills, and, as the seeds take a long time to germinate, the drills may be a good half inch deep—more rather than less when sown in July. Sow thinly, as few people really thin Parsley enough, and there is in some places a prejudice against transplanting Parsley, though I do not know why. I have transplanted Parsley all through the growing season. If we sow in spring the land should be in good condition before the seeds are committed to the ground. There is not much gained by sowing before February, even in favourable situations. In dealing with a choice new sort I have sown in a box or pan, started the seeds in a gentle hotbed, and pricked out as soon as large enough when properly hardened off. When we sow in summer the drills are soaked with water (liquid manure if one can spare it); the seeds are scattered thinly in the drills and covered with fine soil inclined to dryness, as this will keep in the moisture and hasten germination. The thinning should be done before the plants begin to spread much—from 5 to 6 inches apart will

suffice; sometimes more space is given, but when picking begins it will be kept within bounds at the distance apart I have named. Some people sow Parsley sparingly, and never thin or disturb it at all; but it is best to thin moderately. It is very important to have a good supply in winter and early spring. I think it often puzzles gardeners more to produce a good supply of Parsley in February, March, and April than at any other season, especially if there has been a long period of dry frosty weather. Unless we already possess a good supply on some warm sheltered spot for winter, a bed might be planted by taking up some of the early-sown plants in August, cutting off the strongest leaves, and planting in a warm sheltered corner, where protection can easily be applied. A row at the foot of a south wall or fence will be sure to prove useful. If a frame can be spared some roots may be planted where it can be put over them, the lights to be placed over just before frost sets in. Another way of growing winter Parsley is to take up some of the strong roots in August, remove the largest leaves, and plant them all over one or more wire baskets, working the roots in at the bottom and sides of the basket, as well as at the top, stuffing all the interstices full of Moss and filling up the centre with good soil. A fine-curved kind, such as Carter's Fern-leaved, will have a nice effect when in good foliage, hung up in the greenhouse or anywhere. In hot, dry, porous soils the spaces between the rows should be mulched with a mixture of charred refuse and short manure; this will be a great help, for, though Parsley likes a well-drained site, drought in summer is injurious to it.

VARIETIES.—Almost every good seed-firm has an excellent strain of Parsley of its own selection and growth, so that it is not easy to go wrong, and the plant seeds so freely that any one who has once got hold of a good strain may easily save his own seeds. Carter's Perpetual and Carter's Fern-leaved are good varieties, so also is Sutton's Matchless; but, as I have already said, every good firm makes a specialty of Parsley. The Hamburg Parsley, a plain-leaved kind of rather large growth, is sometimes grown for its roots, but they are not in great demand, and consequently are not much grown.

CHAPTER XXVII

Herbs.—Without herbs our dinners would be flavourless. The best and most skilful *chef* could not do much without the little finishing touches which herbs supply in the way of flavouring. Herbs are of sufficient importance in the kitchen to have a small

compartment of the garden set apart specially for themselves, and this compartment should be set out in 4-foot beds, one or more to be planted of each kind, according to the demand likely to arise. Though a part of the garden should be given up to herb culture, "rotation of crop" is as necessary here as elsewhere. Young plantations are the best and most prolific. Sage, for instance, should not be permitted to remain on the same bed more than two years. Thyme, Mint, and Tarragon should be frequently renewed. When an old bed of any kind of plant is done away with, the ground should be manured and turned up deeply in winter, leaving the surface rough, to pulverise and rest till spring, when it might be occupied with one of the annual herbs, such as knotted Marjoram or Basil. Then the next season it might be planted with cuttings of Sage or Thyme. With judicious management the herb garden might continue to occupy the same site while a constant rotation was going on among the various plants cultivated, and at no time would it be uninteresting if rightly managed, so that the herbs need not be relegated to some out-of-the-way corner.

ANGELICA.—This is a handsome plant, not commonly cultivated in this country, flowering early in spring—used more especially in confectionery. It is easily raised from seeds, which may be sown either in August or March. The plants should be thinned from 2 to 2½ feet apart. They will grow from 3 to 4 feet high. If all flowers are removed the plant becomes perennial in duration; it likes a damp soil.

ANISEED.—This is another seldom-grown plant—used chiefly in medicine. Sow in pans or boxes in a warm frame in March, harden off, and plant out 6 inches apart in May in the same way as Basil is commonly grown.

BALM.—This is not a culinary herb, but it is in demand for flavouring claret cup, etc. It is easily increased by division in spring, and should have plenty of space, when it will stand a number of years without transplanting. A root or two may be potted, and forced on gently in spring or at any other season, should there be a demand. For drying cut just before the blossoms open. Dry in an airy room.

BASIL.—There are two annual forms of this valuable herb commonly grown—the Sweet and the Bush. There is not much difference in flavour. One is more dense in habit than the other, and this constitutes the chief difference. Both are annuals, and to obtain them in a condition for use early they should be sown in heat in February or March. I like to sow a pinch of seeds early in February, and grow on in pots for early use. Another sowing is made towards the end of March, which is hardened off in May,

and planted out in a warm sheltered situation, 6 inches apart. The seeds may be sown on a south border and covered with rich light soil early in May, and be left to grow on the seedbed all through the summer. Basil is used in a green state, but for winter use it should be cut when showing flower, dried, and placed in wide-mouthed bottles, and tightly corked. If green Basil is required in winter, a sowing may be made thinly in June, the plants being pricked into 5-inch pots, and plunged out all the summer, having all flowers picked off. They should be moved into a house where a little warmth can be given before frost comes, as the Basil is a tender plant.

BORAGE.—This plant is very easily naturalised. I have not sown any seeds for years, yet always have plenty. It may be sown in March and again in April or May. Its flower is a pretty blue, and has a showy appearance in early spring in pots in the greenhouse. Borage is chiefly used for flavouring cooling drinks in summer, such as claret or champagne cups.

BURNET.—This is a native plant; it is not particular as to soil or situation, but does best in rather light soil. It may be raised from seeds in March, thinned out to 8 or 9 inches apart, or propagated by division of the crowns in spring. The plant is a perennial, and is used chiefly in flavouring salads, cooling drinks, etc. The flowers should be removed as they appear.

CARRAWAY.—This plant is chiefly grown for its seeds, which are used by confectioners. The plant has ornamental Fernlike foliage, and will grow freely anywhere in good land of a free open texture. It is best sown in drills 9 inches apart in spring, the plants to be thinned when large enough to 8 inches apart, and kept clean by frequent hoeings. There is a tuberous-rooted Carraway which will probably become popular when better known. It is very prolific, the tubers being white, from 2 to 3 inches long, and about half an inch in diameter. It may be eaten raw, cooked in various ways, and used in soups.

CHAMOMILE.—This is a white-flowered native plant, much used in medicine. There are two varieties, one bearing single and the other double flowers; the latter is the kind chiefly grown. It is propagated in spring by division and subdivision of the roots, which are planted on well-worked land in April, early in the month, one foot apart each way. Fix the plants firmly in the ground. After they have become established, if the land is at all loose, it is a good plan to tread the bed over to firm it; the feet may pass over the plants as well as the intervals. Select a time when the surface is quite dry, and stir it up with the Dutch hoe immediately after, to prevent a hard crust being formed. Gather

the flowers, when fully expanded, on a dry day. Dry them in the sun, stirring them frequently until thoroughly dried, and then store them in paper bags, suspended in a dry room.

CHERVIL.—The curled variety is the one most commonly grown. Make the first sowing about the middle of February on a south border, and sow in succession as required till the middle of September. The last sowing will stand the winter, and should, like the early sowings, be made on a warm border. Sow in June on a north border, as in the hot weather it soon bolts unless sown in a cool position. It may be sown broadcast or in drills. I prefer the latter plan; draw the drills about 9 inches apart, and thin the plants to 6 inches apart in the rows. In summer, if the plants show a tendency to run up to flower, pinch these off. In very severe winters it is a good plan to have a few plants in pots (they will lift safely) in a frame or in a cool house, as chervil is in almost daily demand for flavouring salads, etc. Seeds for home growth may be saved with great facility if desired.

CHIVES.—This plant used to be more largely grown than it is at present. It is now antiquated, being generally found in old-fashioned gardens; it is used to flavour salads, having a mild Onion flavour. It is easily grown, being propagated by division in spring, and may be planted from 6 to 8 inches apart. The young tops only are used, and they are cut off near the crowns.

FENNEL.—This is a very ornamental plant, and will grow 6 feet or more high in good soil; it is easily propagated by division in spring or from seeds. The latter should be sown in April. I remember that one cold winter some years ago killed every plant I had. I immediately sowed some seeds in a pot, and placed them in a warm pit, where they quickly germinated, and were potted off and grown on in pots till they got strong, when they were planted out. A very few plants will be sufficient for a moderately-sized establishment. In summer the plants—two or three at a time—should be cut over in succession to have young growth coming on. It is a good plan to lift a few plants in autumn, pot and place them in the greenhouse, pushing them on in heat if required.

HOREHOUND.—This is thought much of in some country districts as a medicinal herb, and is grown and used largely among cottagers, being considered a specific for colds. An agreeable effervescing drink is manufactured from it in summer. It is easily propagated from seeds; cuttings and slips, taken off with a piece of root attached, soon make large plants; it thrives in any good garden soil, and should be cut and dried when coming into flower.

HYSSOP.—This is another medicinal herb, of a shrubby character, but not unornamental in appearance. It is easily raised by

cuttings in April, and from seeds sown in spring ; the young plants should be placed from 12 to 15 inches apart.

LAVENDER.—This is a most interesting and ornamental plant, partaking of the character of a small low bush, with woody stems. Groups of 10 or 12 plants are very effective on the lawn. They look best in some retired spot on some shelving bank, where the soil is dry and warm. Lavender is easily propagated from seeds sown in spring, and by cuttings in autumn in a shady situation, and will root with more certainty if a handlight is placed over them. The value of the flowers is too well known to need any comment. The spikes should be cut as soon as the flowers are open.

MINT.—There are several varieties of this plant, but all require the same treatment, so I need not separate them. The one chiefly grown for culinary purposes is the Lamb or Spear Mint. It is a native plant, and therefore is quite hardy. I have found it an advantage to have beds in two aspects, one on a south border for early spring use, and the other on a cool shady border, to produce green Mint in summer. It is easily propagated by division of the roots when growth is just commencing in spring ; or by cuttings, which may be taken with a root attached when the young shoots are 3 or 4 inches long. I like the latter plan best. The cuttings are easily taken by thrusting a knife into the ground, severing the underground stem, when the little shoot will lift up a perfect plant with plenty of roots, and may be at once planted on a new bed, 6 inches apart each way. For winter and early spring green Mint may be obtained by potting up some roots and placing them in heat. The stock for drying should be cut when in flower in August. A top-dressing of old leaf-mould will be beneficial early in spring, just before the young shoots break through the soil.

MARJORAM (SWEET OR KNOTTED).—This is in constant demand, and generally treated as an annual, but the plants will live through a mild winter. I have some plants now growing in a warm corner that stood out all last winter. It is usually sown under glass in April, hardened off, and planted out 6 inches apart in May in a warm sunny spot. A few plants should be pricked off in pots, and be kept under glass for early use. Lift some in autumn, selecting those which have been cut in and are just breaking again ; pot them into 5 or 6-inch pots. These, if placed in a genial atmosphere near the glass, will supply green Marjoram all winter, when it cannot be obtained in the open air. Where plants are kept in pots all the winter, a stock may be worked up from cuttings for planting out in summer ; but, as the plant seeds freely, raising them from seeds gives perhaps the least trouble. Cut for

drying when in flower in August. *Pot Marjoram*.—This is a hardy perennial, will grow anywhere, and is easily increased by division in spring.

PENNY ROYAL.—This is a dwarf mint used for flavouring. It is a native, but unless transplanted annually it is apt to die off in patches. Owing to its close compact growth it holds the damp, and this condition is fatal to it. Every little bit will grow in spring, and new beds are soon formed.

ROSEMARY.—There are several varieties of this, one or two having variegated foliage, but the old green-leaved kind is the best and hardiest. Cuttings in autumn under a handlight will root freely in a shady position; or slips with a heel may be planted any time during winter or spring, sheltered by glass. Rosemary is used by the chemist in the manufacture of scents and preparations for the hair. The plant has an ornamental appearance on the lawn or in the shrubbery border.

RUE.—This is called “Herb of grace” by some country people, by whom it is thought a good deal of as a medicine in spring. The gamekeepers in Norfolk chop the green leaves up fine and mix it with young pheasant’s food. They have great faith in its efficacy with regard to the bird’s health, which, I think, is probably well founded. It is a dwarf evergreen shrub which will grow anywhere in moderately light soil. Cuttings of the young shoots will strike in autumn or spring under handlights, kept close and moist. Plant the cuttings out, when rooted in rows, 15 inches apart, if many plants are wanted, though for the most part one or two will be sufficient, and these may be planted in any out-of-the-way sheltered corner.

SAGE.—This is easily propagated and grown, but should not be left too long on one spot, as old plants sometimes die off during or immediately after a severe winter. It is a good plan to raise a new bed from cuttings every two years, destroying the old bed when the new one has become well established. Cuttings or slips with a heel of old wood will readily and quickly root about May Day, if dibbled firmly into the ground, 8 inches apart each way, and watered if the weather is dry. Sage is not particular about soil or aspect, but the site should be well drained. Where only three or four plants are required, if a few of the outside branches have a little soil placed over them in autumn they will strike root, and a stock of young plants will always be coming on without any further trouble. Sage may be raised from seeds in spring if cuttings cannot be obtained. There are several varieties, but only two are generally grown—the green and the purple.

SUMMER SAVOURY.—This is classed with Basil and Sweet

Marjoram, the seeds being sown in a gentle warmth in April, and the plants hardened off and planted out in May, or it can be sown in May on the bed where it is intended to remain in the open air. When in flower cut and dry the stems with the flowers and foliage in an airy room, and when dry rub and keep in wide-mouthed bottles.

WINTER SAVOURY.—A hardy perennial, used in the same way and for the same purposes as the annual kind, though the latter is generally most appreciated. It is easily increased by division or cuttings in spring.

TANSY—Used sometimes in flavouring, though not much called for. The curled-leaved variety is best. I have sometimes found the leaves useful in table decoration. They are of a dark-green tint, have a fernlike appearance, and rather a nice effect for decorations on the cloth. Tansy is easily cultivated, and, being a native plant, is very hardy. It may be raised from seeds, but it is better to divide an old root and plant out the offsets 12 inches apart. By cutting down a few plants at different periods during summer, a young condition of growth in a part of the stock can always be had.

TARRAGON is used in flavouring salads and in cookery, and is quite indispensable. On some soils it is rather delicate, and, although a native of Siberia, in cold heavy soils in this country it often fails altogether. However, I have never known it to fail on a dry warm site, and where there has been any difficulty with it, if planted on a raised well-drained spot it flourishes and becomes strong, proving that it is not cold but damp that injures it. Tarragon is easily propagated by offsets, which may be taken off in spring with a piece of root attached; or an old plant may be lifted and the root-stock cut into small pieces and planted in a bed. I have struck it in pots and boxes in spring like any ordinary soft-wooded plant, and a box or two of cuttings planted in spring in a warm frame, hardened off and placed out all summer, will come in useful when moved to a genial temperature for producing green shoots in winter; or, if no provision has been made in this way, some roots may be lifted and placed in a forcing-pit. To obtain a succession of nice young growths all the summer, some of the shoots should be cut down at different periods to induce a succession of young ones to spring up. In winter a liberal top-dressing of old manure should be spread over the surface, covering up all the crowns.

THYME.—There are two varieties commonly grown for culinary purposes—viz. the common Green and the Lemon; the former can be obtained from seeds sown in spring, and transplanted when large

enough, or cuttings may be inserted in March or April and kept moist. Division of the roots will, in most cases, answer all requirements, the Lemon Thyme especially yielding to this mode of propagation. Thyme may either be planted in beds, or used as a bordering to any other plant. It is very hardy, but sometimes in severe, cold, wet winters old plants die off; therefore, it is always best not to trust too much to old beds. Select a warm site, with light rich soil, mulch with old leaf-mould or manure, and there will always be plenty of Thyme. It will seed as it grows, and plenty of plants can be raised in that way, without any other trouble. These may be lifted and planted in a new bed to form a succession in spring.

WORMWOOD.—This is exceedingly bitter, and is often used by country people as a tonic. It is cut and dried for winter and spring use, and is strongest when just opening its flowers. Most people cut it for drying then. In the country, if any one wants a tonic, a handful of Wormwood is placed in a jug or pitcher, boiling water is poured over it, and a glassful is drunk every other morning. It has no merit, except for the purpose named, but in a collection of medicinal plants it must be grown. It is a native plant, and grows wild in the fens of Cambridgeshire. May be propagated by seeds in spring; or division, slips, or cuttings in March or April. Will grow vigorously in any light warm soil.

DRYING HERBS.—The active principle of all plants is strongest just when the flowering process is going on, but before seeds are actually formed, and this is, therefore, the best time for cutting and drying herbs. They should not be dried in the sun in August, for that takes too much out of them. An open shed or building is the best place. They may be spread out on shelves, or tied up in small bunches, and hung up to the rafters beneath the roof, where the air can circulate freely among them. When thoroughly dry, they will retain their strength best if rubbed up fine, and placed in bottles, corked up tightly.

CHAPTER XXVIII

Garnishing Plants.—According to the present fashion (which, however, may soon change), dishes of fruit are not placed on the dinner-table. That is now given up to flowers and foliage, and the fruit is dished up and set out on a sideboard, whence it is handed round. This, however, refers only to party nights; at other times the dessert goes on the table in the old way. It is said that "good wine needs no bush;" but it is certain good fruit needs some

garnishing, and where much of it is grown for daily consumption, the leaves to dish it up must be thought about and provided. For dishing up Grapes nothing equals the foliage of the grape-vine. The leaves of some of the late Grapes, such as West St. Peters, Mrs. Pince's Muscat, Barbarossa, and Gros Colman, when ripening off, assume a lovely colour, which condition is maintained for a considerable time, and either black or golden Grapes look well on these brilliant scarlet-veined and blotched leaves. In summer there is usually plenty of leaves to be obtained for dishing up. Besides vine-leaves, which can generally be had, there is

THE CURLED MALLOW, which is very pretty for dishing up all kinds of fruit except Grapes. The seeds are sown in March, and monthly afterwards till August. For placing round Pine-apples and Melons, sprays of the Ice Plant are effective under artificial light. The seeds are sown in spring in heat, and hardened off and planted out in May. It is a rapidly-growing plant when it gets well started. Half a dozen clusters of plants, three in a pot, will be enough for most places.

MELVILLE'S VARIEGATED KALE I have used for Apples and Pears in winter. If well selected when transplanting, the leaves are very pretty, and will be useful for a change in winter. Leaves of the Abutilon Thompsonii are nice in winter. Aucuba japonica, Mahonia Aquifolia, and even the leaves of the Common Bramble, when growing in sheltered places under trees, are very useful. Then there are Ferns and Mosses, and such creeping and hanging plants as Tradescantia zebrina and vittata, and Panicum variegatum, all of which may be used for garnishing if desired. As regards

DINNER-TABLE DECORATION, I am not going to say much, though a good deal might be said without exhausting the subject. Lightness and elegance, rather than massiveness, should be the guiding principle all through. Small, light-foliaged, feathery Palms and Aralias should be used for centres. For common use Cyperus alternifolius, C. a. variegatus, and Grevillea robusta are useful, and nothing hurts them. Small but well-grown plants of Crotons, Dracænas, and Caladiums are bright and effective under artificial light. Small plants of the Maiden-hair Fern are always appreciated for a change. Neat little plants of Begonia insignis and B. fuchsioides, when nicely in flower, are useful in winter. Shallow pans or boxes of Moss, when well furnished, are also useful. To keep up a constant change of plants suitable for table decoration requires a good deal of thought and some pains. To do it well a constant stream of young plants should be coming on, and worked in pots of the most suitable sizes, which should not exceed 5 or 6 inches in diameter. If extra large

plants are required for a large table, they may be turned out of the pots, and the balls enveloped in paper or Moss, and dropped into the receptacles (mostly silver vases) provided for them. A good deal of variety may be introduced in what is termed

DECORATION ON THE CLOTH.—Fern fronds of large or small size may be used to form different combinations. Flowers that will lie flat on the foliage are best, such as Roses, Asters, perennial Sunflowers, Zinnias, Single Dahlias, Poppies, Carnations, Water Lilies, etc. In winter berries of various kinds will be found useful. Individual taste will suggest many ways of using the materials herein mentioned, and others will occur to any person who thinks over the matter carefully. There should be no slavish imitation of my lord or my lady. There has been too much of that in gardening; but free scope should be given to individual fancy.

PART VI

VEGETABLE FORCING

The Pea.—The Dwarf Peas are easily forced in pots; 8-inch pots are very suitable. Start the first crop in November. A cool, light, dry house or pit is the best place for them, and the soil should be good turfy loam, enriched, as far as is necessary, with old manure or leaf-mould—something wholesome and sweet. Plant the Peas moderately, thin all over the surface of the pot, leaving space to add a little fresh soil when they are 3 inches high. They should be as near as possible to the glass, and a little fire, if the place is heated, may be given in severe weather to keep out frost; or if they are grown in a turf pit, coverings may be used in severe weather. Peas under glass will not bear much artificial heat. It weakens the haulm, and a weakly drawn-up stem cannot be expected to carry a large number of well-filled pods. Peas may be planted in pots any time between November and February. Or they may be planted anywhere under glass, during the same period, but they must have plenty of light and free ventilation. Even Dwarf Peas do better when kept in an erect position. So, when 3 inches high, a few small light sticks should be placed round the edge of the pots for the Peas to cling to. The same attention should be given to Peas planted in the borders of a vegetable forcing-house, or in a pit used for the same purpose.

LATE PEAS UNDER GLASS.—Peas may be had later in autumn in pots under glass than is possible in the open air, even when the season is more than usually favourable. Sow a dwarf early kind in August and again in September. Stand the pots under the shelter of a north wall for a month or six weeks. Move to a pit or light house, and ventilate freely. There is not

much trouble, and a dish or two of green Peas in November or later are sometimes much thought of.

VARIETIES—American Wonder.—Very prolific and early, a good variety for pot culture; Little Gem; Multum in Parvo is rather taller than the kinds first named, but has larger pods.

Asparagus.—The main essentials for securing a good supply of forced Asparagus in winter are—1st, A good stock of strong roots; and, 2d, Sufficient artificial heat. The best-flavoured forced Asparagus is raised on hotbeds made of Oak leaves and stable manure in about equal parts, thoroughly intermixed. The first bed is made in November, and a succession is kept up from then till March. The beds are made of sufficient capacity to supply a steady warmth of 75° bottom-heat, and this with coverings will give a top-heat of 60° to 65°, rising to 70° or 75° in the daytime. As regards the roots, the supply of Asparagus being entirely dependent upon the care bestowed upon them in their preparatory stages, it is necessary to say something. Some people force their old beds, making a certain number of new beds each spring to take the place of those removed for forcing. Young plants of three or four years' growth force most easily, and give the best result. When we know how many plants we intend forcing annually, it is a very easy matter to provide that number in succession, year after year. Say we wish to force 1000 roots annually. We calculate that so many rows across a particular plot of ground, at 15 inches apart in the rows, will provide the number, with a margin of some five or six per cent over to compensate for deficiencies in strength in some plants. The seeds are sown in March in drills half an inch deep and 3½ feet apart. When the young plants appear, thin out first of all to 8 inches apart, and afterwards to 16 inches, when the strongest plants can be distinguished. I have sometimes left the plants the first year 8 inches apart, and the second year, when the young growth appears, taken up every alternate plant, and transplanted them elsewhere. This is a very good plan, as it makes the most and best of things. The first year a row of some dwarf vegetables may be grown between the rows of Asparagus. Lettuces, Cauliflowers, or some crop that does not occupy the land a long time, should be preferred. The second year the Asparagus plants should have all the space for the full development of their growth. I am assuming that the land is in good heart, that its condition is kept up by top-dressings and mulchings, and that everything should be done during summer to make the plants strong, for unless the strength is stowed away in the crowns during the growing period, no amount of skill in forcing can supply it, or abstract what is

not already there. In taking up the roots for forcing no unnecessary injury should be done to them, for, though in looking at the masses of root out of which the crowns spring some may think a root more or less cannot make much difference, still it is important that they should be kept as perfect and as fresh as possible.

Forcing on Dungbeds is a very simple and easy matter, and there should not be much variation in the result. In the shortest days a little more material should be used, as the roots may want an extra fillip to start them and produce steady continuous growth. The beds should be a foot wider than the frame on all sides, and from 4 to 5 feet high at back by 3 to 4 feet high at front according to the season. As soon as the heat in the frame becomes genial, which, if the beds are made of equal parts manure and leaves, will be as soon as fermentation sets in, 3 inches of light soil should be put on the bed, and on this place the roots as close together as possible. When the frame is full cover with 4 inches light rich compost, and give enough water at 80° to settle all down. Then put on the lights. Mat up at nights and on cold days till the heads show through the soil. Ventilate a little to give colour and flavour. If white *Asparagus* is desired, cover the roots more heavily with soil; if green, only a little soil need be used. New beds may be made up as often as is necessary. As a rule, if the management has been right, *Asparagus* may be cut in about six weeks from the time the roots are put in, something depending, of course, upon the weather. As fast as one lot is done with, and the plants taken out of the frame, the bed may be planted with Potatoes or sown with Radishes or Carrots; or it may be pulled down and rebuilt with a little fresh material, or a lining may be placed round it and a fresh lot of *Asparagus* roots placed in. There are other ways of forcing *Asparagus*. I have mentioned this first because it is simple, easy, and inexpensive where the materials can be collected on the place, as they can in many instances. It involves a great sacrifice of plants, and, if much forcing is done, a good breadth of land has to be given up for the growth of the roots for forcing. This has led in many places to

Permanent Beds being made, fitted beneath with hot-water pipes, laid in brick chambers, or in a bed of rubble. On this rubble a bed of rich soil is placed, strong *Asparagus* plants being planted therein, and when strong enough for forcing, a fire is lighted, and the lights are placed on. One boiler would heat quite a group of *Asparagus* pits, starting them in succession as required. The cutting must be discontinued before the roots are too much exhausted, and liquid manure would have to be used freely during the growing season.

In May the lights might be taken away and either used for something else or packed away in a dry room till next season. The permanent-bed system of forcing involves much outlay at first, but afterwards the cost is not great. Asparagus may be forced without removal, by having deep trenches lined with bricks between the beds which are to be forced. At the proper season the trenches are filled with warm manure and leaves, frames and lights being placed on the beds at the same time. One or two beds may be covered with frames and lights without any fermenting matter. Simply shutting in the sunshine will hasten the Asparagus a good deal, and the produce from those will fill up the blank between the last forced bed and the first from the open ground. Besides the methods of forcing above noticed, the roots may be lifted and planted in large pots and placed in a vinery or Peach-house, or forcing-house of any kind. Where only small dishes are required for one or two people, this is an economical way of raising it. The pots may first be placed in the Mushroom-house, and moved to a warm light house to give flavour when the Asparagus heads are several inches high. Boxes will answer the same purpose; so will also baskets or hampers—anything, in fact, that holds the roots will do. This method, like the one first noticed, destroys the roots. Old flat baskets, such as nurserymen use in packing plants for their customers, are capital things for forcing Asparagus in; and they may be placed in any house or pit with a night temperature of 60° or so. As regards

VARIETIES, the Colossal seems more vigorous in a young state than the common kind, and youthful vigour is important in raising plants for forcing. If well done by, the plants ought to be ready for forcing when three years old, though, if fine produce is desired, four-year-old plants from the seed will be better. Some people think that there is only one variety of Asparagus; but any one may see on almost any beds, especially if recently made, a white and a green variety. The Colossal, no doubt, is a selection from some vigorous plant; and now so many people are going in for Asparagus culture that it might answer any one's purpose who had leisure to raise by selection improved varieties of Asparagus. There is nothing impossible in it—patience and perseverance will certainly produce some useful result.

Carrots.—A nice genial bottom-heat of 65° to 70°, such as is produced by a bed of leaves with just enough stable manure mixed with them to hold them together, will force Carrots in the best possible manner. Make up the first bed early in the new year, and as the heat rises place on the bed 6 inches of light sandy soil. Level and firm it a little, and sow the seeds thinly

broadcast. When about 1 inch high thin out to 2 inches apart, and sift a little light rich soil over them. Other beds may be made up in succession if required; in fact, there is no difficulty in obtaining young Carrots all the year round, as the winter supply can be obtained from a sowing of early Scarlet Horn on a warm border in July, leaving them in the ground, drawing them fresh as required, and sheltering them in severe weather with dry fern or litter. The best variety for forcing is the early French Horn. Early Horn Carrots may be raised in spring without glass. Dig out a trench 2 feet deep, fill in with warm manure, place 6 inches of good soil on the top, and sow the seeds, covering thinly with light sandy soil. Protect the bed at night and during cold days with hoops and mats.

Cauliflowers.—Veitch's Forcing Cauliflower has small compact hearts, very close and white. The habit of the plants is dwarf and sturdy, and well adapted for forcing, succeeding well in pots or planted out on a bed of leaves and manure, in a pit, or in the borders of a low light house. Cauliflowers are not generally required before May: indeed, by growing a good stock of late Broccoli there is no difficulty in obtaining good white heads of Broccoli as late as the middle of June. But young early Cauliflowers are generally more esteemed than late Broccoli; at any rate it is as well to have two strings to one's bow, and where there is space under glass, or a temporary hotbed can be made in a warm sheltered corner, Cauliflowers will not cost much to produce. A Cauliflower that turns in so quickly need not be sown so early as the Early London. Sow in November, under glass, in a box; prick off singly into 3-inch pots, plunge the pots in a bed of leaves near the glass, and shift into larger pots as more space is required, still keeping the plants near the glass in a pit or house where there is a little warmth. As the days lengthen, a little more heat may be given if necessary to hasten their growth, but forcing should not be resorted to unless full light can be given. Very nice little Cauliflowers can be grown in 6-inch pots if the pots are plunged in leaves or sawdust, or something that will generate a little warmth. I have sown the seeds as late as Christmas, and cut from the plants in May by growing them on in heat. The forcing should be gently done, especially when the plants are getting large; there should be plenty of ventilation, and they should occupy a very light position. Liquid manure will be a great help during the latter part of the time.

French Beans.—With adequate means, French Beans may be had all the year round. In winter they must have a light position near the glass in a temperature of 60° to 65° at night,

with a rise of at least 10° in the day, or more in bright weather. They are commonly grown in pots. Any sized-pots will do, but I prefer those about 8 or 9 inches in diameter, filled two-thirds full of turfy loam and manure, two-thirds of the former to one of manure. Put one large crock over the hole at the bottom, and place a handful of rough turf over it; fill the pot two-thirds full as stated. Press down a little, and plant five beans round near the sides of the pot, and one in the centre, covering about 2 inches deep. The pots may stand under the stage till the plants show through the soil, then they must be placed near the glass if they are to do well. The best position I have in winter is a broad shelf at the back of a lean-to forcing-house. There the growth is dwarf and robust, and the blossoms numerous, which all set and produce Beans, the progress being rapid. A light span-roofed house is also a good position for them. It is not often that a house can be given up to the forcing of Beans; usually they are worked in with Cucumbers or Vines, or in some other mixed arrangement. If a house could be given up to them, I should like to have it arranged as the old-fashioned Pelargonium-houses used to be fitted up twenty or thirty years ago.

For succession it is necessary to start a fresh lot every three weeks or so; and all Beans must be gathered comparatively young, so that the plants may produce to their fullest extent. When the young plants are well above the rim of the pot, earth-up with rough rich soil, and place a few small sprays of Hazel or Birch round to give the necessary support. The only enemy to guard against is the red spider, and this is a real danger when Beans are forced in vineries, or with Peaches, Strawberries, or Cucumbers, especially about March. This evil is more easily prevented than cured. Frequent use of the syringe, a genial atmosphere, and a little sulphur on the pipes, will generally keep them at bay till the Beans can be had in the pits or elsewhere. As regards their culture in pits, I have grown them successfully in low pits such as are commonly used for Potatoes or Melons. It is entirely a question of temperature. French Beans require rather a higher temperature than Potatoes, and the pits should have some warmth beyond what is supplied by fermenting materials, at least in winter. From February onwards the hotbed system will do very well. Even when a supply of Beans can be had in warm houses, I always think it is advisable to plant the last crop in a pit or frame; these fill up the intervals between the last crop in the forcing-house and the earliest in the open air. They are planted in March, in rows across the pit, 2 feet apart, the Beans being 6 inches apart in the row.

VARIETIES.—The Newington Wonder is an excellent variety for the short days in winter. The pods are small, but the plants bear very freely and continuously. Osborn's Forcing is another good kind, and the Canadian Wonder comes in well when the days lengthen in spring.

The Potato.—Few things are more eagerly sought after than early Potatoes. To be able to dig early in April the sets must be started at the beginning of the new year, and grown on steadily without check. The selection of the seed and its preparation are important matters, as, like all other things, there is in Potatoes an inherent propensity to productiveness or the reverse, and if the seeds were saved from the productive roots only (especially for forcing) the crops would be much larger. Some Potatoes of the same variety are much more productive than others, and my own opinion is that the cause of this is constitutional. Therefore, when taking up Potatoes that we intend saving for seed, the best and most productive only should be saved. It is a very easy matter, in digging, when we come to a very productive root to save the best and handsomest for seed. In October, the selected seed should be placed in shallow baskets or trays, crown upwards, in a single layer; the trays or baskets to be placed in some light position, but safe from frost. Under the stage in a cool greenhouse is a good place to start the central crown eye. All others must be cut or rubbed off, as only one stem should be permitted to grow. The first beds ought to be made up in January, and should contain enough material to keep up a steady heat till the crop is full grown. Tree leaves should enter largely into the composition of the hotbeds for forcing vegetables. They are both genial and lasting, and the labour required in turning and mixing to prevent overheating is almost *nil*. In forcing Potatoes in frames or pits, from 10 inches to 1 foot of light rich soil should be placed on the beds; and when the warmth has penetrated it, the sets may be planted, covering them about 3 inches deep. Sometimes the sets are helped forward in pots, and in that case the beds need not be made quite so soon. The space under glass is valuable, and must be made the most of; and as each set is limited to one stem, 18 inches between the rows and 9 inches between the sets in the rows will be ample. When the plants are 8 inches high, place a ridge of soil between the rows, and in a day or two, when it has become warm, draw it up round the stems of the plants. During the growing season the soil must be kept fairly moist, but when grown on beds of fermenting materials, unless the weather should be bright, the plants will not require water often. Once a week will be sufficient, and it should be given on the mornings of bright

days. When the crop is nearly full grown watering should be discontinued, as too much moisture in the soil at that season spoils the flavour and texture of the tubers.

FORCING POTATOES IN POTS.—It may sometimes happen that there are conveniences for growing Potatoes in a Peach-house or some other light forcing-house, or that a broad shelf near the glass can be spared in a greenhouse for Potatoes. The question of temperature is not so important in the case of Potatoes as in that of French Beans for instance. It is true that the Potatoes will be fit for use sooner if grown in a temperature of 60° than if the night temperature does not exceed 50° ; but in other respects, if the other conditions are equal, the crop may be as good in the cool house as in the warm one. Ten-inch pots are a good size for Potato culture, and there should be two tubers in the centre of the pot—the drainage being sufficient to ensure a rapid clearance of all surplus water. Put one large crock over the hole, and a layer of large pieces 2 inches thick over it, with a few inches of rough turfy loam on the crocks. Fill the pots half-full of soil, and plant the Potatoes near the centre, covering 2 inches deep, adding more soil as growth progresses.

FORCING POTATOES WITHOUT GLASS.—This is done by creating temporary shelters—it may be low walls of straw, reed, or turf, with coverings of similar materials to place on at night or shelter during cold days. The soil is thrown out, and 2 feet or so of warm manure placed in the trench; on the manure 1 foot of nice mellow soil is laid, and in this the Potatoes are planted. Warm sunny borders may be treated in this way, and temporary shelters of any kind used. These may be made of straw or reeds—glazed calico will last a long time. Mats may be sewn together, and drawn over hoops. These latter I have found useful over south borders with only ordinary culture, and have had Potatoes fit to dig by the middle of May.

VARIETIES.—Plant the old Ashleaf for the first crop, with Myatt's prolific in succession.

Seakale.—There are two ways of forcing Seakale. One—the old-fashioned way—is to cover the crowns with pots, and place enough fermenting matter (tree leaves chiefly) over them to create a temperature in the pots of 60° to 65° . If it exceeds this the produce will be weakly, and may possibly have an earthy taste, but this temperature will not be exceeded unless too much manure has been mixed with the leaves. Forced in this way the plantations will go on bearing for a number of years without renewal; but it makes a good deal of litter, and to keep the temperature steady requires watching. When rightly managed, the Kale is fine, white,

and sweet. The second way—and perhaps I might call it the modern way of forcing Seakale—is to take up the roots in autumn, and force them in succession, as required, in some heated structure adapted for the work, where a temperature of 60° can be maintained. A Mushroom-house does very well, or a darkened pit; or it may be forced in small quantities by planting the roots in boxes such as wine-merchants use to pack wine in. In planting the roots space must be left between the crowns and the lid of the box for the Kale to grow—from 8 to 10 inches will in most instances suffice, and space enough should be left between the crowns for the full development of the blanched growth. If the crowns are strong, 3 inches will not be too much. It is as well to take up all the stock of roots we intend forcing and lay them in thickly on the north side of a hedge or wall; this has a resting ripening tendency, and they will force all the better for it. All small roots and pieces of roots removed from the large ones, intended for forcing, should be laid in and covered with a little loose litter till the spring, and then cut up into pieces 4 inches long and planted in rows, with a dibble, 18 inches apart, and 12 inches apart in the rows, just covering the thick ends of the roots, which in the course of time will develop strong crowns.

TO KEEP UP A SUCCESSION, fresh relays of roots should be introduced every three weeks or so. After the cutting of the first crowns, if they are not cut too deeply into the roots, a fresh lot of shoots will start, smaller considerably than the first, but in other respects quite as good; indeed, some people like these second growths best, saying that they are more delicate both in appearance and flavour. When the old roots are encouraged to produce all they can, they are not so useful to plant out again, nor is it necessary, as the small pieces planted in March will produce strong crowns in one year.

BY SEEDS.—It may sometimes be necessary to raise plants from seeds. I have often sown seeds of Seakale about the third week in March, thinned the young plants out, guarded them from slugs and snails in spring, and had them strong enough to force the following winter. I do not think I should trouble to sow seeds when I had plenty of root-cuttings, but plants from seeds are just as good to force as the others if both are equally strong.

Celery.—Though not often forced beyond its first period of life, yet, if done very gently on a bed of leaves in a deep pit or frame, it may be obtained very early for any special purpose. The plants are pricked into pots, shifted on till the bed is ready, then planted out all over the bed at equal distances apart; 9 inches will give nice little heads, but if large produce is required more

space should be allowed. When large enough to blanch, draw the stalks up carefully without bruising, wrap a sheet of paper round them, and secure it loosely with a piece of matting. When all are tied up, place the material used for blanching among the plants with care,—tree leaves (if sweet), short hay (if not mouldy), old tan, coal-ashes, chaff or cut straw, moss, or anything of a like nature that is not likely to give a bad flavour to the Celery. The best kinds for forcing are those of dwarf sturdy habit, that do not soon bolt. Incomparable White and Major Clarke's solid red are good varieties.

Turnips.—If sown in light rich soil, on a bed of leaves and manure, and the soil is kept moist, Turnips may be had much earlier and better than under ordinary circumstances. If a trench be opened in a sheltered place, and filled full of warm manure, placing 8 or 9 inches of light rich soil on the top, a bed will be improvised that will bring forward not only Turnips, but nearly every kind of vegetable. Some shelter will be required at night; but this may be of a very simple character. Some long Ash or Hazel rods bent over hoop-fashion will form the skeleton, over which can be thrown mats, canvas, or oiled calico when required. The Strap-leaved Stone is a good variety for forcing, the Early Milan Strap-leaved being the best form of it.

FORCING SALADS

Lettuces.—Some of the best Lettuces I ever had were forced in a frame on a bed of leaves and manure. They force very easily—scarcely any plant takes to it so kindly; it is only necessary to force them in winter and early spring. Usually, in most places, good Lettuces can be obtainable till after Christmas where there are frames to shelter them, or where a good hardy kind is grown and they are protected by coverings of dry Fern or leaves. Any time after Christmas these Lettuce seeds may be sown in heat, and if pricked off into hotbeds, made of leaves and manure, such as Potatoes and other vegetables are usually forced upon, they will, with the lengthening days, make rapid progress. Sow the seeds thinly in boxes, in a warm house to grow on whilst the hotbed is made ready; and as soon as the plants are large enough to put out, and the bed with its surface of rich soil, 8 inches deep, in a nice genial condition to receive them, select a mild day, and plant them at suitable distances apart, according to the variety grown. The small Cabbage Lettuce, known as Paris Market, is the earliest that I know. Tom Thumb, another small

Cabbage Lettuce, is also very early, and a very good kind. The best Cos Lettuce is the London White, when true. The Alexandra Cos is a good successional kind. It is a good plan to plant the small Cabbage varieties alternately with Cos, 6 inches apart, as the Cabbage varieties will be full grown and cut by the time the Cos requires the space.

Endive.—This is not often forced, because it sometimes bolts when sown early in the open air; but when sown in a mild hot-bed, and grown unchecked, the tendency to bolt is not at all prominent. It requires the same treatment as the Cos Lettuce, and should be tied to blanch when full grown, or when large enough for use. The White Curled is a good variety for forcing; it does not take so long to blanch.

Chicory is sometimes used as a substitute for Endive. The seeds are sown early in May, in drills 14 inches apart, and the young plants are thinned to 9 inches or less, according to the sized roots we desire. Some give a preference to roots of only a moderate size, and then the sowing may be delayed a little longer, and less space allowed. The roots are lifted rather late in autumn, stored away like Carrots or Beet, and potted a few at a time, as required. Five or six roots may be potted with the crowns just above the soil in a 10-inch pot, or they may be planted in a bed in the Mushroom-house, or in a box deep enough to cover and keep the light from the young growth as it comes up, for, no matter where forced, it must be in the dark in order to have the young shoots of a delicate flavour and free from that bitter principle natural to the family when unblanched. A nice genial temperature of 55° to 60° will produce good results.

Dandelions make excellent salad plants to mix with Lettuces in winter or spring. The roots are best cultivated after the manner of Chicory, but still less space will be required, as they will not get so large. Those found in the pasture field or by the wayside may be carefully taken up, and if potted six roots in an 8-inch pot, or planted in a box, and placed in a dark place having a genial temperature, a very wholesome salad will be the result. When grown in pots or boxes, it will be an advantage to put an empty pot or box, inverted, over those that they are growing in. This tends to keep the atmosphere surrounding the plants close and moist, and makes growth more tender and delicate.

Radishes.—During the forcing season, early in the year, Radishes are taken as a stolen crop when forcing other things. They are often sown with Carrots and Potatoes, as they come off before the other crops require the space, and scarcely any harm is done if they are drawn for use as soon as fit. If they grow by

themselves, a good many Radishes may be obtained from a very small bed. They do not require much heat. If they have a little to start them, just to cause the seeds to germinate quickly and get fairly into growth, shelter will do the rest. To keep up a succession a little bed should be made up every three weeks or so, from December till the end of March. After that they may be had in the open air by the aid of improvised shelters. In no case should they be sown too thickly, as they draw each other up weakly, and run too much to top. The best varieties for forcing are Wood's Frame, as a long-rooted variety; French Breakfast, and the early White Forcing Turnip.

Young Onions.—These are sometimes used to flavour salads, and if in demand they should be sown in heat in boxes, and drawn when quite young. Onion seeds germinate very quickly in a high temperature, and it can scarcely be too high to start them if they are wanted in succession; but as soon as the young plants appear above ground move to a light position, where the night temperature ranges from 55° to 60°.

Water-cress.—Of late years this has come to be grown under glass for winter and spring supply. Cuttings are obtained which are planted in pits or frames of rich loamy soil. Sometimes pots are used, placed in shallow pans of water. The cuttings are planted rather thickly, and shaded a little at first. A greenhouse temperature will suffice, though, if in a light position, more heat than is customary in such a house may be given. After the first gathering, give liquid manure occasionally. The cuttings may be planted in boxes, brought on in a forcing-pit, and moved to the greenhouse afterwards to flavour and colour; or they may be inserted in pots like any other soft-wooded plant, started in the propagating-house or pit, and when rooted potted off, and moved to the greenhouse when established. Water-cress should be grown on without checks or chills, and then it will be tender and of good flavour. If cuttings are not available seedlings may be raised by sowing in heat and growing them in the same way that cuttings are treated.

Plain Cress.—This is the variety commonly grown for forcing. It is usually sown in boxes, one or more at a time, according to the demand. The boxes are about 2 feet long and 11 inches wide, made of half-inch deal, and are handy and light. A coat of paint helps to preserve them. They need not be deep for Cress; if they are 4 inches deep, they can be used for other purposes. A few half-inch holes are bored through the bottom for drainage, and about 2 inches of rough soil placed in as a foundation. On this a layer of fine, light, sandy soil is placed, and pressed down

firmly with a flat piece of board. On the surface the seeds are sown rather thickly, and left uncovered. Any warm houses or pit will do for the forcing of Cress; and as Mustard is often required in association with this, it is generally sown at the same time and under like conditions. If Cress or Mustard is required in larger quantities it may be sown in frames. Market gardeners generally grow it in this way, but in private places it is more important to have a small regular succession than to have a large quantity at any one time. A small sowing every five or six days will keep up a good succession.

Tarragon and Chervil.—Tarragon is constantly in demand for flavouring salads, and a stock should be potted in autumn and brought on in heat to use green. It will be advisable to have a few plants of Chervil under cover for flavouring salads, for it is sure to be required. It may be planted in a pit or frame, or a few plants may be potted and placed in the greenhouse. The plant has an ornamental appearance, and a few pots of it will not occupy much space.

PART VII

MONTHLY CALENDAR OF WORK

JANUARY

Flower Garden and Shrubbery.—Shelter tender things with branches, Moss, or Fern. Plant deciduous trees and shrubs in open weather. Mulch and stake at once; lay down turf, and make alterations. Manure and dig beds and borders. Plant any bulbs out of the ground except Ranunculi, which should be kept till next month.

FRUIT GARDEN.—Plant young trees where required. Prune and train wall trees. Regulate the growth of Orchard trees, thinning the branches where badly placed and too thick. Dress mossy trees with quicklime. Prune and train espaliers. Make new plantations of Bush Fruits and Raspberries; cuttings of Gooseberries and Currants should be planted. Mulch old beds of Strawberries with manure. Lime is a good antidote in the case of slugs and snails. Wash Pear and Peach trees infested with scale, and Apples on which cotton-blight exists, with a strong solution of Gishurst compound (6 oz. to the gallon).

VEGETABLE GARDEN.—Sow Peas, Long Pod Beans, Horn Carrots, and Radishes on early border. Sow Cauliflowers in heat; give all the air possible to Cauliflowers in cold frame. Protect Broccoli turning in, and Celery in frosty weather. Rectify all defects in drainage, and trench, dig, and manure vacant plots; clear up rubbish-heap, and char or otherwise make available for manure all waste substances.

CONSERVATORY.—Keep up a genial temperature of 45° to 50°. Keep down insects as much as possible with the sponge. If any plant is infested with green-fly or thrip, remove it to another house

to be fumigated, as Tobacco-smoke may be objectionable in the conservatory, and it makes the petals of the flowers fall a good deal. Give Camellias weak liquid manure. Never permit dead flowers or leaves to remain; water in the morning, and do not make more damp than is necessary. Ventilate without creating draughts.

STOVE.—Night temperature need not exceed 60° to 65° . Devote all spare time to get rid of insects. Give no quarter to mealy bug.

FORCING FLOWERS.—Roses, Rhododendrons, Azaleas, Lilaes, Dielytras, Spireas, Lily of the Valley, Dutch Bulbs, etc., can be brought forward as required; night temperature about 60° . Verbenas and other bedding plants, of which stock is required, should have a little extra warmth to induce growth for cuttings.

FORCING FRUIT.—To have ripe Grapes in June, the vinery should be closed for forcing about the middle of the month. Begin with a night temperature of 50° ; water the inside borders with tepid liquid manure.

PINES.—Keep the temperature steady at 60° to 65° . Do not over-water, especially plants which are intended to start into fruit shortly. See that the glass is clean, to admit all the light possible.

PEACHES.—To have fruit ripe in June, close the house early in the month; examine the border, and moisten every dry spot with tepid manure water. Start the trees very quietly. Do not, till the buds begin to move, exceed 45° at night.

FIGS should be pruned and cleaned ready for an increase of temperature. The plants in pots that require more root-space should have it at once. The roots of large plants may be reduced if necessary, in order to make room for new soil.

STRAWBERRIES.—Start the plants in a temperature of 55° , in successive batches of fifty or so, according to the number of plants forced; keep the plants near the glass.

FORCING VEGETABLES.—Sow seeds of Cucumbers and Melons. Plant Potatoes in frames, and in pots in the greenhouse. Plant French Beans in pots in the Pine-stove or vinery. Force Seakale and Rhubarb in the Mushroom-house, or under pots in the old-fashioned way. Force Asparagus in hotbeds, with a bottom-heat of 75° . Plant Chicory and Dandelion roots in Mushroom-house to blanch. Make up Mushroom beds in succession. Sow Horn Carrots and Radishes in frames. Pot up from the beds Mint, Tarragon, Chervil, and place in heat; sow Mustard and Cress in heat.

FEBRUARY

Flower Garden and Shrubbery.—Proceed in open weather with the planting of deciduous trees and shrubs, including Roses. All new groundwork involving the removal of turf should be finished without delay. Herbaceous borders should be top-dressed with manure; and the plants may, where too large, be divided and transplanted. Top-dress weakly turf with artificial manure, or with a mixture of soot, wood-ashes, and nitrate of soda, using the nitrate at the rate of 3 cwt. to the acre. Plant Box and other edgings. Turn over gravel walks, and stir the soil freely among beds and borders of spring flowers.

FRUIT GARDEN.—Prune and train Apricots and Peaches towards the end of the month. Prepare materials for protecting the blossoms. Finish all pruning of orchard trees without delay. Top-dress any exhausted trees with manure. Give spare liquid manure to any trees needing a concentrated stimulant. There is yet time to plant young trees. Turfy loam placed within reach of the roots of fruit trees has very great value.

VEGETABLE GARDEN.—Sow Peas and Beans in succession. Peas and Beans are often started in pots or boxes or in turves, in gentle heat, and planted out when the weather settles. Work up all arrears of manuring and digging. Plant Box-edgings. Sow Horn Carrots, Radishes, and Lettuces, and plant Ashtop Potatoes on early border. Transplant Cabbages and Lettuce. Give all the air possible, when mild, to Cauliflowers. Stir the surface when dry, and do not permit a weed, snail, or slug to live. Sow Round Spinach between the rows of Peas.

CONSERVATORY.—Prune Creepers which have done flowering. Cut back Salvias and other plants whose season is past. Put in cuttings of soft-wooded plants to raise young stock. Let nothing suffer for want of water, and give as much fresh air as the nature of the weather will permit. Sponge dirty foliage with soap and water, and keep down fires to as low a point as possible consistent with safety.

STOVE.—The general repotting of stove plants should take place this month. All the handsome Creepers, such as Allamandas, Dipladenias, and all Ferns, should have their annual shift now, reducing the balls of the plants by shaking away as much of the inert exhausted soil as can be done without injury. Ferns may be divided for stock purposes. Start Gloxinias and Achimenes. Repot Caladiums, Anthuriums, and Alocasias. Put in cuttings of

all plants of which young stock is required. Keep the night temperature about 65°. Recently-potted plants must be watered carefully. Increase the atmospheric moisture, and in ventilating avoid cold draughts.

FORCING-HOUSE.—Bring on relays of all the plants in stock for forcing, which should include Lily of the Valley, Azaleas, Deutzias, Spiræas, Paul's Scarlet Thorn, etc. The early-flowering Pelargoniums will now be opening their buds, and in a light house, at a temperature of 50°, Zonal Pelargoniums should be very bright. Autumn-struck Fuchsias will be coming on. Tuberoses and Gardenias are nice for cut flowers.

PROPAGATING-HOUSE.—Cuttings of all kinds of soft-wooded plants may be inserted in pots of sandy soil, and plunged in a bottom-heat of 80°. Bedding plants may be increased rapidly under like conditions. Roses may be grafted now on roots of Briar or Manetti Stock.

THE VINERY.—The Vines in early house will now be breaking into growth, and all surplus shoots should be removed. One shoot to a spur is quite enough to leave finally. Raise the night temperature to 55°. See that all inside borders are moist. Ventilate early on fine mornings, and close early in the afternoons. The thermometer may rise to 80° immediately after closing without injury. Syringe when closing, or sprinkle borders and paths.

PEACHES.—The blossoms at this early season will require some assistance in setting. Some use the camel-hair pencil. Ventilate freely, and give the trellis a shake when the pollen is dry at midday.

PINES.—Plants intended for fruiting may have an increase of temperature, and be kept for a time on the side of dryness at the root rather than risk giving too much water. Syringe and close early in the afternoon. Temperature at night for fruiting plants 65° to 68°. Succession 60° to 65°.

STRAWBERRIES should be carefully set with the camel-hair brush. When enough has been set for a crop (say a dozen on each pot), remove all surplus blossoms. Give liquid manure three times a week after the fruits are set.

MELONS.—Plant out in house, and train to single stem. Press the soil firmly about the roots, using good sound loam. Temperature at night 65°, bottom-heat 75° to 80°.

FORCING VEGETABLES.—Plant successions of Potatoes, French Beans, Horn Carrots, Radishes, Asparagus, Seakale, Mushrooms, etc. Make up hotbed for Cucumbers. Top-dress plants in early house frequently, as it is a great encouragement. Plant Paris Market Cabbage-Lettuce on a gentle hotbed to come in early. Sow Mustard and Cress as often as required.

MARCH

Flower Garden and Shrubbery.—Finish planting deciduous trees and shrubs. Mulch and water if dry. Transplant evergreens in dull showery weather. Turn gravel walks and trim turf-edgings. Prune all kinds of evergreen shrubs. Cut Ivy on walls and fences close in with the shears. Divide and replant all kinds of hardy plants. Plant *Ranunculus* and Pansies beginning of month. Stir the soil freely among advancing spring flowers. Press the soil round the necks of Pinks or other plants loosened by frost. Roses may still be planted, and towards the end of the month old-established beds of Roses should be pruned. Prepare beds for Carnations, Hollyhocks, Dahlias, and Phloxes, by adding manure and fresh turfy soil. Prune and train Creepers.

FRUIT GARDEN.—Protect the blossoms of wall trees. There are many ways of doing this, which are fully referred to elsewhere. Remove the coverings from Figs on walls end of month. Tie in and shorten Raspberry canes. Keep a sharp eye on Peach trees, and if the green or black aphid appears apply Tobacco powder. New plantations of Strawberries may be made now if sufficient were not planted in August.

VEGETABLE GARDEN.—Sow Onions, Parsnips, Horn Carrots, Peas, Beans, Cauliflowers, Brussel Sprouts, Borecole, Leeks, Chervil, Spinach, Seakale, Lettuce, Turnips, Radishes, Asparagus, Parsley, and small Salads. Plant Cabbages, Lettuces, Globe Artichokes, Cauliflowers, Jerusalem Artichokes, Potatoes, Horse-radish, Seakale Sets; Rhubarb may be divided and replanted. Make up Mushroom beds in the open air. Prepare new Asparagus beds for planting in April. Manure, dig, and make ready for cropping all vacant land. Earth-up, and stick all Peas as they require it. Plant cuttings of Water-cress under north wall or in a frame, and keep moist.

CONSERVATORY.—The house will be gay now with bulbs, Cinerarias, Primulas, and forced plants, such as Azaleas, Roses, Rhododendrons, Richardias, Prunus, Lily of the Valley, Weigelas, Deutzias, Dielytras, and Spiræas. Camellias, Acacias, and Australian plants generally, will be very gay. In a light house the Zonal Pelargoniums will be a strong feature. With the longer days will come a greater demand for water. Plants that have done blooming should have all straggling growths reduced, and be moved to a rather warmer position to make new growth. Hard-wooded plants must not be kept in the warm conservatory too long,

as the house cannot well be too cool for them. If they must remain, place them at the coolest end. The Climbers and wall plants should be regulated as they advance in growth, to prevent entanglements.

STOVE.—Complete the potting of all specimen plants without delay. Large specimens should have a large proportion of fibry loam used in the compost. Keep the house a little closer for a week or two after the potting is finished, to encourage growth. Pot off *Achimenes*. Repot *Caladiums*, *Anthuriums*, and *Alocasias*. Pot on *Crotons*, and keep them as near the glass as possible to give colour. Put in cuttings of winter-flowering *Begonias*, *Justicias*, *Euphorbias*, *Poinsettias*, and other winter-flowering plants. Do everything possible to keep down insects by sponging and fumigating. Keep up a good supply of atmospheric moisture.

FORCING FLOWERS.—Successions of everything required should be introduced at regular intervals. Paul's double Scarlet Thorn forces well, and so will most of the hardy deciduous flowering shrubs if rightly managed.

PROPAGATING.—All kinds of bedding plants may be rooted with ease and certainty now in a hotbed with a temperature of 75° to 80°. Roses may be grafted in heat, and cuttings of Tea-Roses obtained from forced plants, which on getting firm will root freely at this time. Seeds of tender and other annuals should be sown now. Cuttings of Tree Carnations planted in saucers of moist sand, standing on a warm surface, will shortly take root. All cuttings should be shaded from bright sunshine.

FORCING FRUIT.—Under the influence of lengthening days the early Grapes will be making rapid progress. Disbud as soon as the best bunches can be seen, leaving in a general way only one lateral to a spar, and only one bunch of Grapes on each lateral; all others in each case should be removed. Stop all laterals at the first or second leaf beyond the bunch. Thin the Grapes as soon as those berries which are taking the lead can be seen. If the Grapes are expected to keep long after they are ripe they must be well thinned. Some Grapes, notably the Black Hamburg, set freely, others require a little help. Shaking the rods when the pollen grains are dry is useful. Drawing one's hand gently down the bunches when in flower, or using instead, for the same purpose, a light hair brush, are all expedients which have been tried with good results. The vines in the late vinery will now be just breaking their buds. The disbudding and other work should be carried out as in early forcing. The night temperature of the early house should now be from 60° to 65°. In the afternoon at closing time

the thermometer may run up to 80° or 85°, with the atmosphere of the house well charged with moisture.

PEACHES.—Disbud the young growth, and if the fruits are set very thickly remove some of them from the under side of the branches. This will lighten the trees, and leave all the crop on the upper side to select from. Syringe morning and evening. Do not let the temperature exceed 50° by fire-heat yet at night. Be careful to use only soft water, of the same temperature as the house, to syringe with. Close early in the afternoon.

PINES.—Towards the end of the month select a time when the weather is calm and mild, and overhaul the whole stock, repotting all that need more pot room; or if any have got into a bad condition during winter, shake them out and shorten the plant by cutting off a piece off the bottom, strip off some of the old leaves, and repot in smaller pots firmly. The suckers should be taken from the old stools, from which the fruits have recently been cut, and started in small pots. Top-dress plants showing fruit, or which are expected to show shortly. Shift the strong successions into the fruiting size. The bottom-heat should be partially or wholly renewed according to circumstances. Use the syringe daily, and close early on fine afternoons. With the lengthening days will come a greater demand for water, and a thin shade to break the rays of the sun.

FIGS.—Pinch the young wood back to the fifth leaf. If the shoots seem thick, remove the weakest, as there must be plenty of space. Give liquid manure freely, and syringe daily. Keep the night temperature from 60° to 65°.

MELONS.—Plant out in pits and frames, and raise fresh plants for successional crops. Peg out the shoots as they grow, stopping the leaders as they near the sides of the frame. Use strong loam to plant in, and press it down firmly. Ventilate early in the morning to create a robust habit.

BANANAS.—This is a good season to take suckers for growing on. They require a lofty house, and a night temperature of 65° to 70° to do them well. Plant in boxes of rich soil, or in beds or large pots, as is most convenient.

STRAWBERRIES.—Bring on strong plants from the cold pit in succession. Give more air, but still use the camel-hair pencil to make sure of a good set. Thin the blossoms, and tie up the fruits to keep them above the foliage. Use liquid manure freely.

FORCING VEGETABLES.—Less forcing will be needed now that the days are longer and the sun more powerful, but we cannot do without the glass, though successional hotbeds may be made slighter and of less active materials. Potatoes, Cauliflowers, French Beans,

Carrots, Seakale, Asparagus, Turnips, Tomatoes, Cucumbers, and Mushrooms, must still be obtained from artificial resources. Sow Celery for main crop, and Cucumbers to fill up frames for successional beds.

APRIL

Flower Garden and Shrubbery.—Plant all kinds of evergreen trees and shrubs. Prepare flower-beds for planting next month. Stir the soil freely among spring flowers. Prune late-planted Roses; train Creepers; prune back Clematis. Plant Holyhocks, Carnations, and other hardy plants. Sow all kinds of hardy annuals in beds and borders. Divide and replant hardy herbaceous plants. Propagate Dahlias by dividing the roots. Prune all kinds of shrubs, and look after snails, slugs, and insect-pests generally.

FRUIT GARDEN.—Uncover wall trees on fine days to give all the air possible. Commence to disbud Peaches. Use Tobacco powder if there are any signs of aphides. Finish grafting. Mulch Strawberries; make new beds of Alpine Strawberries. Prune and train Fig trees on walls. Stir the soil freely among fruit trees.

VEGETABLE GARDEN.—Make new plantations of Asparagus and Globe Artichokes. Sow Peas, Beans, French Beans, Beet, Carrots, Broccoli, Brussels Sprouts, Cauliflowers, Savoy, Celery, Chicory, Cucumbers, Vegetable Marrows, Lettuce, Radishes, Rampion, Salsafy, Scorzonera, Spinach, New Zealand Spinach, Turnips, and Dandelions if required for salads. Propagate all kinds of herbs by division of the roots, or by cuttings or seeds. Finish planting Potatoes. Earth-up early crops. Dig all vacant land, and prepare it for cropping.

CONSERVATORY.—Shift into larger pots everything that requires more root-space. This applies more especially to New Holland plants, Azaleas, Heaths, Fuchsias, etc. Climbers will require frequent attention. Use the syringe or engine freely among Orange trees and Camellias; and any pruning these or other plants require to maintain symmetry should be done now. Plants growing in pots and borders will require more water now. Forced plants, which have done flowering, should be moved to a cool house to recuperate.

STOVE.—Shade will be necessary now for most things on hot days. Crotons form an exception; if they are shaded too much they will not colour. Shift on young growing specimens. Cuttings of stove plants will strike freely now; and young plants are useful

for table decoration and general furnishing. Provide a good stock of *Lycopodium denticulatum* and small Ferns.

FORCING FLOWERS AND PROPAGATING.—This house may soon be turned to some other account now. It comes in well for Tomatoes or Cape Gooseberries if desired. Strong plants of either or both, put out now, will soon make headway; neither of them require much root-room. Cuttings of all kinds of bedding plants may be rooted, and seeds of such tender annuals as Stocks, Asters, Marigolds, etc., sown. Anything in seed pots that are large enough to handle should be picked off.

FORCING FRUIT—GRAPES.—Finish thinning Grapes as fast as they become fit, and be careful not to injure or handle the berries. Pinch back all sub-laterals. Keep inside borders moist. Give air as soon as the sun strikes full upon the house—a small opening at first, to be gradually increased. The shoots of late Grapes should be tied down and the leaders pinched. Render all the assistance possible in setting, so as to secure well-shaped bunches. Night temperature, 60° to 65°.

PEACHES.—Thin out the fruits to 8 or 9 inches apart, leaving them as far as possible on the upper side of the trellis. Syringe twice a day with soft water, same temperature as the house. Ventilate early, and close at half-past three in afternoon. Feed with liquid manure as often as is necessary to keep the border in a moist healthy condition. Fumigate with Tobacco if there are any green or black aphides present. On the first indication of mildew, use sulphur in the syringing water. Tie down young wood as it progresses. Night temperature, 55° to 60°.

PINES.—In syringing avoid wetting ripening fruits, or those in blossom; and in watering also withhold water after the fruits begin to colour. With the lengthening day swelling fruits should have an increase in the atmospheric temperature, especially at closing time in the afternoon, letting the thermometer run up on a warm sunny day to 80° or 90°, with plenty of moisture in the atmosphere. Night temperature may continue from 65° to 68°; fruiting-house, 60° to 65° successions.

FIGS.—Keep the young wood thin, and regularly pinched back to five leaves. Trees on trellis should be regularly tied in, and until the fruit begins to ripen the syringe should be used freely to keep the foliage clean and encourage growth. Figs in pots will need a good deal of liquid manure to encourage the fruit to swell. When the fruit is in blossom a rather drier atmosphere should be maintained. This period may be known by the expansion of the eye of the fruit. Night temperature, 65°.

MELONS.—Keep up a moist healthy warmth, both bottom and

atmospheric. Keep the growth thin, and set the crop of fruit as nearly as possible altogether. If any get too much lead the others will not swell. Rub a little sulphur on the walls and pipes as a check to red-spider. As soon as the crop is set (and from 4 to 6 fruits to a plant is a fair crop, if the Melons attain to a good size) pinch all young shoots back to keep the main leaves from overcrowding.

STRAWBERRIES.—Bring on fresh relays of plants as fast as the fruit is gathered from the preceding lot, so as to have them coming on in regular succession. Thin the blossoms to about a dozen, with plenty of air circulating among the plants; the blossom should set now without any assistance. Feed well with liquid manure, and syringe freely, until the fruit begins to ripen, to keep down red-spider.

FORCING VEGETABLES.—Potatoes, Carrots, Peas, and Cauliflowers in frames may have the lights drawn off altogether on fine warm days. Tomatoes, whether grown in pots or planted out, will require a good deal of attention in pinching and training. Cucumbers also must be carefully managed now. A little shade will be required on a bright day, and frequent top-dressing will be beneficial. Asparagus covered with glass only will come on fast now. Seakale and Rhubarb will only require blanching. Forced Lettuces should be tied up, and have free ventilation.

MAY

Flower Garden and Shrubbery.—Plant hardy edgings round flower-beds early in month, and the bedding plants after the 20th. Calceolarias may go out earlier. Thin out and transplant annuals. Plant Dahlias. Stake all plants needing support. Train Creepers. Mulch and water newly-planted shrubs and trees. Transplant Hollies. Kill insects on Roses.

FRUIT GARDEN.—Disbud Peaches. Kill green and black fly everywhere; for an emergency Tobacco powder is a good remedy. Remove protections from fruit trees about the 20th. Look after the eggs of the Gooseberry caterpillar; they will be found on the under side of the leaves, ranged in two rows on each side of the midrib of the leaves. Water Strawberries if the weather is dry.

VEGETABLE GARDEN.—Sow Marrow Peas, Broad Windsor, Scarlet Runner, and Dwarf French Beans. Plant Cabbages, Cauliflower, Lettuces, New Zealand Spinach, and Leeks. Sow Broccoli and other winter greens for last time. Sow Round

Spinach, Basil, Summer Savoury, and Sweet Marjoram on warm border. Plant out Vegetable Marrows and Ridge Cucumbers. Sow Beetroot, Chicory, Radishes, and Walcheren Cauliflowers. Plant out Veitch's Autumn Giant Cauliflowers raised in heat. Make up Mushroom-beds in open air. Plant out Tomatoes against south walls or fences. Sow Turnips. Plant cuttings of all kinds of Herbs. Thin out Parsley.

CONSERVATORY.—Use the syringe or engine freely in the evening to keep down insects. Move plants out to cool house to fumigate, if necessary. Train Creepers frequently. Thin and stop superfluous growth everywhere. Shift into larger pots all plants that need more root-room. Train Fuchsias, Pelargoniums, etc., and give liquid manure. Ventilate freely, and shade when bright.

STOVE.—Maintain a moist atmosphere. Pinch the young specimens to make them symmetrical. Keep Crotons and Caladiums near the glass to infuse colour into the leaves. Take cuttings of anything of which stock is required. Shift on young plants of Bouvardias, Begonias, Justicias, etc., for winter blooming. Put in cuttings of Poinsettias. Basket plants will now require a deal of water—should be dipped in a tub occasionally. Plants that are growing rapidly should be rearranged weekly to keep them in condition. Ferns will require shade. Night temperature, 70°.

FORCING-PIT.—Young plants of Gardenias should be shifted into larger pots, as they require more space. Seedling Ferns to be potted off into single pots, and kept close and shady. Young stock of all kinds to be kept in a dense bushy state by pinching and occupying a position near the glass. Night temperature, 65°.

NORTH HOUSE.—This will be found useful for retarding plants that are coming on too fast, especially if it is wished to exhibit plants or cut flowers at the summer shows. All places under a glass roof may be made more genial by sprinkling the paths and stages once or twice a day.

FORCING FRUIT—THE VINERY.—Pinch all sub-laterals to one leaf, and permit no growth beyond. Keep inside borders moist. Ventilate more freely when the Grapes begin to colour. Leave a little air on all night; mix a little sulphur in milk, and rub on the pipes, as a preventive against red-spider. Keep down thrips by fumigating with Tobacco. Thin late Grapes freely to prevent damp lodging in the bunches. Mulch all borders, and remove all plants from vineries as far as possible. Night temperature, 65°; Muscats, 70°.

PEACHES.—Withhold water when the fruit begins to ripen, and give all the air possible, considering the state of the weather. Tie in all young wood, and expose the ripening fruits to as much air and sunshine as possible in order to colour them perfectly. The young wood in the late house must be thinned, so that the young shoots are not less than 5 or 6 inches apart. Gross shoots on standard trees should be pinched to 8 or 10 inches.

PINES.—Keep up a moist growing temperature; more water will be required now, both in the atmosphere and also at the roots. Suckers may be taken off and potted for stock wherever they can be obtained. Plants showing fruit should have a little increase in temperature; from 65° to 70° will suffice, closing early in afternoon. A little shade should be used on bright days, from 10 till 3.

FIGS.—Top-dress, and give rich liquids; keep the young growth pinched persistently to five leaves. The first crop will be ripe and ripening now, and the second coming on in succession; but they require a good deal of nourishment. Night temperature, 65°.

MELONS.—Ripening fruit must have no water; plenty of air must be given. Thin out all surplus wood and leaves. Plant succession Melons in frames and pits in rather heavy loam.

STRAWBERRIES.—Plants in cold pits will be coming on now, and should be well supplied with nourishment. Syringe freely just before the fruit begins to ripen, to keep back insects. Late fruit in houses should have plenty of air and water. Continue to thin the blossoms of plants in flower.

CAPE GOOSEBERRIES.—Train up young wood, and pinch side-shoots; they are easily managed. Plant in loam, and train to trellis near the glass. A temperature of 55° will suit them.

GREEN GINGER.—This is sometimes grown for preserving green. The stock-roots are kept dry, or nearly so, in pots in stove. In February, when the buds begin to start, the old plants are shaken out of the soil and cut up into small sets, which are potted in single pots and plunged in a hotbed. In May, when the bedding plants are cleared out, a pit is prepared, and the roots are planted in a compost of loam and leaf-mould. The crop is lifted in autumn when full-grown.

CUCUMBERS.—Give liquid manure freely. Maintain a steady bottom-heat of 75°, and a night temperature of 65°. Top-dress with fresh compost frequently. Pinch all young shoots one leaf beyond the fruit. Keep a moist atmosphere, by deluging the paths; shade when the sun is bright. Sow seeds and strike cuttings for successional crops.

JUNE

Flower Garden and Shrubbery.—Finish bedding out. Peg down Verbenas and other things of straggling habit. Tie up Hollyhocks, Phloxes, Dahlias, Carnations, etc. Keep down weeds. Salt may be applied to gravel walks, if necessary ; should be done in dry weather, with care. Sow seeds of Canterbury Bells and all kinds of biennials and perennials. Prick off seedlings before they become crowded. Water Roses, and syringe to keep down insects.

FRUIT GARDEN.—Disbud Grape Vines on walls. Go over Peaches twice this month to complete the thinning of the wood and the fruit if they have set too thickly. Thin Apricots if they are too numerous. Disbud the young shoots where too thick. Commence to remove the breast wood from wall trees, doing the top part of the trees first. Water Strawberries.

VEGETABLE GARDEN.—Plant Scarlet Runners, and set out Celery early in month. Sow Lettuces on cool border. Thin out early Turnips, and sow again. Thin Carrots, Parsnips, and Onions. Plant out Leeks. Sow Peas and Dwarf French Beans. Plant Cauliflowers, Brussels Sprouts, and all kinds of winter greens. Sow Radishes and Rampion. Stir the soil freely between the rows of Potatoes and earth them up. Plant Cardoons in trenches. Train Tomatoes. Water if dry, and keep the hoe going.

CONSERVATORY.—The lights may be left open night and day now. Shift on young Fuchsias and other plants that require more pot-room. Thin out the plants by the removal of the least effective to the open air. Water inside borders, giving liquid manure to any plant that needs help, especially plants heavily laden with blossoms. Keep down insects either by fumigation or syringing.

STOVE.—Fumigate the moment a thrip or green-fly appears ; the former are fond of Crotons, Gardenias, and other smooth-leaved plants. Sponge all plants on which mealy bug appears, using a strong solution of soft soap. Train near the glass the young shoots of Allamandas, Dipladenias, and Stephanotis.

FORCING FLOWERS.—All plants that have been forced should be placed in the open air now to ripen and harden the growth. If convenient, the lights should be removed from the Rose-house to give the plants as complete a rest as possible. Hardy shrubs intended for forcing again should be plunged out in the open air. Sow Cinerarias and Primulas ; young plants of double Primulas will be better now in the cold frame in a shady situation.

FERNERY.—Shift any choice young specimens that need more room into larger pots ; keep a moist atmosphere, and shade from bright sunshine. Water freely. .

FORCING FRUITS—THE VINERY.—The early Grapes will now be ripe. Avoid making any dust in the house. There will be less need for pinching back sub-laterals, as the growth will probably be completed now. Pay attention to ventilation, and do not discontinue fires altogether. The late vinery will require artificial warmth to keep the Grapes moving steadily on. Water inside borders freely. Ventilate early in the morning to prevent spotting and cracking.

PEACHES—EARLY HOUSE.—Give all the air possible, but withhold water. Gather the fruit a day or two before it is quite ripe, and lay it on a sheet of wadding in the fruit-room.

ORCHARD-HOUSE.—Use the engine freely every afternoon at four o'clock, and close the house. Give an inch of air last thing at night, and ventilate more fully in the morning. Top-dress plants in pots. Keep the young wood thin. Thin the fruits to 8 inches apart. Fumigate with Tobacco if insects appear.

PINES.—About the middle of the month the whole stock should be overhauled. Some will require repotting, others will do with a top-dressing. Suckers to form successions will be taken from old stools, and be potted singly in 48 or 32-sized pots, and plunged in a bottom-heat of 75°. All the plunging beds should be renewed with fresh tan, and a general rearrangement take place that will last for the summer. The fruiting-house may run up at closing time to 90°. Night temperature, 70°.

FIGS.—The chief aim now is to keep the foliage clean and swell the fruit off to a large size. The second crop will be swelling rapidly. The second crop is generally more numerous, but the fruits are not so fine. A sprinkling of artificial manure on the borders or pots, and watered in, will be useful.

MELONS.—Peg out the leading shoots of the plants recently set out, and pinch when the end of the rafters of the house or the outside of the frame is reached. Set the crop as much as possible altogether.

CUCUMBERS.—Top-dress plants that have been some time in bearing ; using a little artificial manure with the soil (about one pound to a bushel). Set out more young plants for late bearing. The frames and pits or houses from which the bedding plants have been taken will be useful for late Cucumbers. Keep the growth thin, and cut the fruits before they get old, unless seeds are required. Give a mild fumigation if there are any green-fly.

JULY

Flower Garden and Shrubbery.—Layer and pipe Carnations, Picotees, and Pinks. Sow biennials, such as Canterbury Bells, etc. Put in cuttings of all kinds of hardy plants under handlight in shady border. Prune overgrown shrubs. Stake everything that needs support. The pegging, pinching, watering, and arranging of plants in flower garden will find constant employment now. Bud Roses as soon as the bark works freely. Mulch and water Roses, Dahlias, Hollyhocks, and Phloxes. Keep all surfaces on bed and border freely stirred with the hoe.

FRUIT GARDEN.—Remove breast wood from all wall trees and espaliers. Thin the fruits on all trees where too heavily laden. The question as to what should constitute a crop must be decided according to the strength of the tree. Mulch all trees that seem to need support. Water Apricots and Peaches if the weather should be dry. Keep down insects. Nail in young wood left to fill vacancies on walls. Plant new beds of Strawberries.

VEGETABLE GARDEN.—Plant Celery. Earth-up early crop. Plant winter greens of all kinds. Sow Cabbages end of month, and early Peas for a late crop beginning of month. Sow Parsley and early Horn Carrots. Sow Lettuces and Endives twice during month. Train Tomatoes to expose fruit. Cut down and remove old stems of Globe Artichokes. Plant Cauliflowers for autumn use. Sow French Beans for last time beginning of month. Sow Chervil. Make up Mushroom-beds in a shady place in open air. Sow main crop of Turnips. Give liquid manure to Celery, Cauliflowers, Lettuces, etc. Keep down weeds by hoeing.

CONSERVATORY.—Train Climbers. Give liquid manure to Fuchsias, Pelargoniums, etc., in bloom. Move Azaleas and New Holland plants to open air at end of month to ripen their wood. Keep the plants thin. Leave ventilators open all night now. It will be an advantage if the engine can be used frequently to encourage growth and keep down insects.

STOVE.—Shade and moisture are very essential now, except for Crotons and Dracenas, which colour better with a full exposure to sunshine. Stephanotis, Allamandas, and Dipladenias flower best when the young wood is trained near the glass. The young shoots can afterwards be taken down and trained round the balloon, or whatever shaped trainer is employed. Young growing specimens may be shifted into larger pots. Flowering stove plants, such as Gloxinias, Vincas, Achimenes, etc., may be moved to conservatory to bloom.

NORTH HOUSE will be useful now for retarding plants that may be required for exhibition. Keep it cool by damping the floors daily.

FERN-HOUSE will need shade now, and plenty of moisture in the atmosphere. The close-growing Maiden-hairs dislike water over the foliage, but the large-growing hard-leaved Ferns may be syringed with advantage. Shift young growing specimens into larger pots. Pot off seedlings. Divide pots or pans of *Selaginellas*.

COOL ORCHID-HOUSE.—Use the syringe freely, and shade from 10 till 4. If thrips or other insects appear, fumigate with Tobacco two evenings in succession.

VINERY.—Stop laterals regularly. Thin late Grapes freely to prevent decay when the short days come. Rub a little sulphur on the Grapes as a deterrent to red-spider. Water the inside borders, and outside borders also if they require it. Ventilate freely, especially when colouring begins.

PEACHES.—Withhold water from ripening fruit. Pinch back all lateral growth. Use the syringe freely till the fruit begins to ripen. Gather all fruits a couple of days before they are ripe, and place them in the fruit-room to finish off. Ventilate early in the morning. Keep the soil moist till the ripening process begins. Trees in pots will require careful management in this respect.

FIGS.—Pinch all young laterals back to one leaf. Withhold the syringe when there are ripe fruits on the trees. Mulch and use liquid manure to give size and finish to the fruits. Ventilate freely.

PINES.—The early part of the month is a good time to give the general summer repotting and put in a fresh batch of suckers for succession. They may be taken off the old stools any time, and it is good policy to put them in at rather frequent intervals. Pot all Pines firmly, using turfy loam enriched with bones, soot, and a little dry horse-manure. Keep rather close after repotting, and syringe gently morning and evening. Shade on bright days from 10 till 4.

MELONS.—Keep the growth thin. Set the crop of fruit as far as possible at the same time. Ventilate freely, but do not shade. Press the soil firmly about the roots; use rather heavy turfy loam. If canker appears, dress the place heavily with newly-slacked lime.

CUCUMBERS.—If mildew appears dust with sulphur; fumigate with Tobacco to kill green-fly. Top-dress with rich compost; pinch all growth one joint beyond the fruit; shade when very bright.

AUGUST

Flower Garden and Shrubbery.—Propagate all kinds of bedding plants from cuttings, beginning with Verbenas, Heliotropes, etc., first, leaving the Pelargoniums till the last. Bud Roses, both Briers and Manettis. Put in cuttings of all kinds of hardy plants in prepared bed on shady border. Propagate Carnations, Picotees, and Pinks by layering and cuttings under handlights. Put in cuttings of Hollyhocks, Pansies, and Penstemons. Sow annuals for spring bedding. Divide roots of Daisies, Primroses, etc.

FRUIT GARDEN.—Bud Plums, Peaches, Pears, and Cherries when the bark works freely. Remove all surplus wood from wall and other trained trees. Thin finally the fruit of Pears, Plums, and choice Apples beginning of month. Late-keeping fruits are well worthy of attention. Water and mulch all trees heavily cropped, especially wall trees. Make new beds of Strawberries. Net-up ripening fruit of all kinds to protect from birds. If wasps are troublesome, find the nests and destroy them.

VEGETABLE GARDEN.—Sow Cabbages about the 2d of the month; also Spinach, Onions, Lettuce, and Endive. Finish planting winter Greens. Sow Turnips for last time, and Radishes weekly. Earth-up Celery, and plant out the last-sown crop. Draw soil to Leeks. Save up manure for Mushroom beds. Harvest Onions. Sow Cauliflowers about the 28th for spring.

CONSERVATORY.—Open all the lights to their fullest extent now, as plenty of fresh air is very beneficial. Many plants commonly kept under glass will do better in a sheltered place in the open air during the month. One of the brightest subjects for the conservatory in autumn is the Scarborough Lily, *Vallota purpurea*; and to bloom them well after the growth is made, they should be placed out in the open air for a month or six weeks—from the 1st of August till the flower-spikes begin to show early in September. Keep the growth of Creepers properly regulated. Water freely plants growing in borders. Shade when bright.

STOVE.—Train specimen Allamandas and Dipladenias. Keep up a moist atmosphere by sprinkling stages, walks, and walls. Anything likely to need repotting should be shifted at once. Young plants of the winter-flowering species will be better in a cool pit for the present. Night temperature, 65° to 70°. Some of the flowering stove plants, such as *Franciscea Calycina*, etc., will ripen better if kept in the open air for a month.

FORCING-PIT.—*Gesnerias*, *Gloxinias*, *Begonias*, *Justicias*, etc., should be kept moving on, with plenty of moisture. The *Gesnerias* and *Gloxinias* must have shade. *Cyclamens* raised in spring must be grown on quietly to flower in winter. This is a good time to sow seeds.

VINERY.—Vines ripening their fruit must have a free circulation of air. Borders should be mulched to check evaporation. It is better not to have plants in the houses from this till the fruit is cut if it can be avoided. Keep the lateral growth pinched on late vines. Fumigate with Tobacco if there are any thrips on the leaves.

PINES.—Plants in flower must not be syringed, nor yet those bearing ripening fruit. All others to be syringed freely morning and evening, closing not later than 3.30. Water twice a week, if the plants require it. Shade when the weather is bright. Keep a steady bottom-heat of 75° to 80° . Top-heat, 65° to 70° .

PEACHES.—Water the borders of late houses, giving liquid manure; but as soon as the fruit begins to ripen discontinue watering. The ventilation must be as free as possible. In bright warm days the lights will be better off altogether. Keep down all laterals. Trees from which the fruit has been gathered should have a good washing with the engine, and if the weather is dull and damp a little fire to ripen the growth will not come amiss.

FIGS.—The second crop will be ripening freely now. Use a little fire to prevent damp, and ventilate freely. Keep the young shoots thin to secure perfect maturity.

MELONS.—Do everything possible to keep out red-spider. Syringe on bright days at closing time; also in the morning it will have some value. Sulphur painted on the frames inside, and tin bottles filled full of hot water and covered with sulphur, is a good preventive, and should be placed in the frame where the sun can reach it.

CUCUMBERS.—Sow seeds for winter supply; Telegraph is a good variety. Plant the seeds singly in small pots in a close pit. Cuttings may be taken also. Top-dress old plants in pits and frames to keep them in bearing condition as long as possible.

TOMATOES.—Put in cuttings for winter planting. The Criterion is a good winter kind. Carter's Dedham Favourite is also a good variety.

SEPTEMBER

Flower Garden and Shrubbery.—Finish the propagation of bedding plants early in the month. Towards the end of the month lift any plants it is necessary to save. A good deal of sweeping and picking will be needed now to keep things in order. Transplant Evergreens end of month. Put in cuttings of shrubs. Layer Rhododendrons, and other Evergreens. Gather seeds of annuals, etc.

FRUIT GARDEN.—Root—prune over-luxuriant trees. Gather early Apples and Pears. The fruit-room and all connected with it should be sweet and clean. Keep all runners cut from Strawberries. Beds that are too thick may have every alternate plant cut out. Remove mulching from Apricots and Peaches; there will not be too much solar warmth now.

VEGETABLE GARDEN.—Earth-up Celery. Plant a few rows for late use. Plant Cabbages, Lettuce, and Endive. Sow Lettuce and Endive for last time. Sow Tripoli Onions and Prickly Spinach for late crop early in the month. Transplant Parsley to sheltered place where it can be covered with glass or straw mats. Tie up Lettuces and Endive to blanch in succession. Keep down weeds.

CONSERVATORY.—The Creepers on the roof that have done flowering should be shortened back. The Lapagerias and other things just coming into flower must of course be left, but no unnecessary shade should be allowed. Such plants as Camellias, Azaleas, New Holland and Cape plants, and Oranges, in pots or tubs, that have been placed out in the open air, should be brought back end of month. The ventilators should remain open at night till there is danger from frost. No fire will be required yet.

STOVE.—Keep the fires steady; night temperature, 65° to 68°. Bouvardias and other things for winter blooming should be placed in a light part of the house. Ferns will still require a little shade. Young plants of Crotons and Dracenas for dinner-table decoration should be placed in the full light to colour them well. Poinsettias should shortly be placed in a brisk temperature to give size to their flower heads.

VINERY.—It is well, north of London, to use a little fire to finish off late Grapes, and to ripen wood. Keep the foliage on the vines, from which the Grapes have been cut, healthy as long as possible; and if any doubt exists as to the perfect ripeness of the wood, use a little fire to warm it up and finish it. It is some-

times thought that if the houses are thrown open the abundant ventilation must ripen the wood, but warmth is wanted as well. Look over ripe Grapes frequently to remove bad berries.

PEACH-HOUSE.—Use the engine freely over the trees where the fruit has been gathered. Never permit the red spider to get a footing in the house at any time. Late Peaches must be gathered two or three days before they are ripe, and placed on a sheet of wadding in the fruit-room. Bruised Peaches soon decay.

PINES.—About the middle of the month, when the weather is settled, give the plants their autumn dressing. Some of the successions will probably require shifting into larger pots. Suckers may be taken off, potting them into 6-inch pots. Those plants intended to show fruit during winter or early in spring may have some of the old soil removed, and be top-dressed with fresh turfy loam. The bottom-heat materials should be seen to, and put into a condition to last through the winter till March, as there will be no chance of renewing them before that time.

CUCUMBERS AND TOMATOES.—These should be kept moving steadily. Only a moderate crop of fruit should be left on the plants now. If they exhaust themselves now they may fail altogether by and by, when it will be important to have Cucumbers. Frequent top-dressings are beneficial. Insects, green-fly, and thrips must be looked for closely, and the moment one makes its appearance measures must be taken for its destruction. Gentle fumigations of Tobacco are best, persevering till all are killed.

MUSHROOM-HOUSE.—Make up a number of beds now for autumn and winter use. Usually the beds made now do well. Mushrooms succeed very well in a close shed. Coverings of hay or straw will be necessary to keep the beds at a comfortable temperature, and to prevent the moisture evaporating.

OCTOBER

Flower Garden and Shrubbery.—Alterations involving the removal of earth and the transplanting of shrubs and turf may be commenced now. Plant Box and other edgings; also bulbs, Pansies, Daisies, Primroses, and annuals to flower in spring. Plant Pinks in beds, and pot-up Carnation and Picotee layers end of month. Divide and transplant herbaceous plants.

FRUIT GARDEN.—Grub up old useless fruit trees, and prepare the sites for replanting. Change the soil if possible. Lime is a necessity for stone fruits, and if it is not present in the soil of the district it must be added to the fruit borders. Good turfy loam

from an old pasture is the best soil for fruit trees. Finish lifting the roots of trees showing signs of grossness. Gather fruits as they become ripe.

VEGETABLE GARDEN.—Take up roots, such as Potatoes, Carrots, and Beet; dry and store them for winter use. Finish the earthing of Celery and Leeks. Lift Cauliflowers turning in, and plant deeply in sheltered border, where straw hurdles or mat can be used if needful. Plant Lettuce and Endive in frames. Heel in Broccoli. Plant Cabbages.

CONSERVATORY.—Do the watering in the morning now. Camellias, Acacias, etc. planted in border will need liberal supplies of water. Liquid manure will be beneficial occasionally. Chrysanthemums should all be under cover now; also such things as Salvias, Eupatoriums, and Tree Carnation, which have been planted out. The Scarborough Lily (*Vallota*) will be bright now. To induce them to flower freely, keep them in a cold frame well ventilated all summer. Reduce all Creepers within moderate bounds. If hard-wooded plants are wintered in this house they should occupy the lightest and coolest end. It may be necessary to use a little fire now if the nights are frosty. Pot Dutch and other bulbs for forcing.

STOVE.—To induce *Eucharis* to flower plunge them in strong heat. They must be grown well at first to get the bulbs strong. Begonias of the insignis and semperflorens type will be useful now, as will also Gesnerias, Cinnabarina, and hybrids. Gloxinea bulbs that have rested may be started now for flowering in January. Caladiums should gradually go to rest; must not be allowed to get dust-dry.

FERNERY.—Keep up a genial temperature of 55° to 60°. Palms are among the most useful plants for furnishing rooms for large parties. They are easily grown, but require a good deal of space to do them justice.

COOL ORCHIDS.—*Dendrobium nobile* and other East Indian Orchids should be moved to the stove, unless there is an East Indian house. The Peruvian *Odontoglossa* will be coming into blossom now. They should never be allowed to suffer for want of water. Very little fire will be required. There must always be a dampness in the house.

FORCING-PIT.—This will not be required to be pressed at present; but a stock of shrubs and other plants, such as Lily of the Valley, Tuberose, etc., should be prepared for forcing.

ROSE-HOUSE.—Prune all Roses to well-ripened wood, including Teas. Repot all that require it, and top-dress those which do not, using a little artificial manure, either Aimes' or Clay's, mixing

it with the soil at the rate of one pound to the bushel. Roses succeed best in a rather heavy loam.

VINERY.—The early Vines should be pruned. A little fire-heat will be beneficial to late Vines whose fruit is not yet ripe. Root-lifting, in the case of Vines where the Grapes are cut, if necessary, may be done now. Ripe Grapes must be examined frequently, and bad berries cut out.

PINES.—Maintain a genial temperature in the fruiting-house, 65° to 68° at night, with a proportionate rise in the day. Successions should be kept moving steadily along. The watering must be done with care now. The syringe should only be used on bright days. The water, both for syringing and for watering, should be of the same temperature as the house.

CUCUMBERS.—Night temperature, 65°; bottom heat, 75°. Stop with finger and thumb all shoots one leaf beyond the fruit. Top-dress frequently. Cut all fruit as soon as fit for use. Sow seeds for planting out after Christmas. Use moisture enough in house to keep the atmosphere genial.

NOVEMBER

Flower Garden and Shrubbery.—All kinds of deciduous trees and shrubs may be planted now, also bulbs and spring-flowering plants, including Pinks and Pansies. Pot up Carnation layers, if not done in October. This is the best season to plant Roses, except Teas, which had better be held over till March. Trench and dig flower-beds, lay turf, and lay up leaves for hotbeds and to make leaf-mould.

FRUIT GARDEN.—Plant fruit trees. Mulch and stake immediately. Pruning may be done as soon as the leaves fall. Train wall trees, commencing with Pears and Plums, leaving Peaches and Apricots till the last. Prune Vines on walls. Make new plantations of bush fruits.

VEGETABLE GARDEN.—Force Asparagus in hotbeds or in boxes and baskets in forcing-house. Force Seakale in Mushroom-house, also Rhubarb. Plant French Beans in pots or boxes, and place them in forcing-house near the glass. Make up Mushroom beds for successional bearing. Sow Cucumber seeds for early spring work. Provide protecting materials for sheltering Celery, Lettuces, Cauliflowers, etc., if frost should set in.

CONSERVATORY.—Chrysanthemums will be gay now, and, as far as possible, the temperature of the house for the time being should be suited to their wants. Therefore only moderate fires

must be used. Ventilation must be free. Rearrange the plants weekly to keep up the interest, removing all flowers that are fading and bring forward others just coming to their best.

STOVE.—This house should be gay now with winter flowers. The atmosphere must be genial. Night temperature about 65°. Keep a sharp look-out for insects, especially mealy bug, which must be destroyed if the plant-grower is to have peace of mind. *Amaryllis* should be brought to the front as the flower spikes show up. In a mixed collection the *Crotons* and other fine-leaved plants should occupy the lightest position.

FERNERY.—This house will require no shade now. Plants that are required for the rooms should be grown near the glass to make the fronds hardy and lasting. The same treatment must be given to Maiden-hairs and others required to furnish fronds for bouquets, etc. Less water will be required now the days are short, but all must have enough to keep the roots active.

ORCHIDS.—Many of the *Dendrobiums*, *Cypripediums*, and *Odontoglossums* will be showing flowers. Maintain a genial atmosphere, but keep down the fires as much as possible. Slugs and snails often do a good deal of damage at this season in eating the flower-buds before they expand. They are easily caught at night when feeding by taking a light into the house.

VINERY.—To have ripe Grapes in May the first house should be started now. The Vine rods should be washed and dressed, and all the paint and glass thoroughly cleaned. Sometimes the first crop is taken from pot Vines and the permanent Vines eased. Ripe Grapes may be cut, bottled, and placed in a dry cool room. New Vine borders may be made now.

PEACHES.—Prune, clean, and train the trees in the early house. See that the borders are moist. Add fresh turfy loam, if necessary. A little artificial manure will be useful. Have the house and all it contains made perfectly clean.

TOMATOES AND CUCUMBERS.—Steady progress is all that is required at present. Not much forcing should be done till the days get the turn. Keep down insects on the Cucumbers by fumigation. Tomatoes are not much troubled with insects. *Cri-terion* is the best variety for winter bearing.

DECEMBER

Flower Garden and Shrubbery.—In open weather proceed with planting trees and shrubs, laying turf, and making any necessary alterations. Spring flowers and bulbs may be planted. Over-

grown shrubs should be pruned, gravel-walks turned, and grass rolled frequently, to keep all bright and neat. Climbers on walls may be pruned and trained. Shelter tender plants.

FRUIT GARDEN.—Get as much of the planting, pruning, and training done before Christmas as possible, as the spring always brings fresh work. Dress Apple trees infested with American blight with a strong solution of Gishurst compound. If the trees are old, better remove them, clear away the old soil, and plant young trees in fresh soil. Syringe Gooseberry bushes with lime and soot in solution to keep off birds.

VEGETABLE GARDEN.—Wheel manure on vacant land and trench it up 2 feet deep. Give all the air possible to Cauliflowers in frames in mild weather. Scatter a few dry wood-ashes among the plants occasionally. Shelter Lettuces with dry leaves or ferns. Cover those in frames on cold nights with mats. Winter Broccoli turning in should be lifted with balls and planted in cold pits, or where some shelter can be given.

FORCING VEGETABLES.—This work will now be in active operation. Asparagus, Seakale, and Mushrooms are in season now. Rhubarb also should be plentiful. Plant Potatoes in hot-beds prepared to receive them. They may also be planted in 10-inch pots and brought forward near the glass in the forcing-house. Herbs, such as Tarragon, Chervil, Mint, etc., should be obtainable in a green condition now.

CONSERVATORY.—Plants from the forcing-house will now be coming on. Camellias also will be unfolding their blossoms. Weak soot-water will be beneficial to the latter once a week or so. The temperature at night may range between 45° and 50°. Avoid making a dust in sweeping floors, as it lodges on the leaves of the plants and injures their action.

STOVE.—The chief work here will consist in keeping down insects and bringing forward fresh relays of forced flowers. Among these latter the Bouvardias and Poinsettias will be conspicuous now. The night temperature need not exceed 65°. Small or moderately-sized specimens of *Dendrobium nobile* will be useful. Tuberoses also should be plentiful, and the sweet white blossoms of *Gardenias*.

FLOWER FORCING-HOUSE.—This will be in active operation now. Bulbs, Lily of the Valley, Tuberoses, shrubs of various kinds, *Dielytras*, *Spiræas*, Roses, and many other things, will be brought on as required. The night temperatures may range about 65°. A moist genial atmosphere must be kept up. Tuberoses should be potted in batches, and brought forward, a few at a time, as required.

COOL GREENHOUSE.—Bedding plants should be kept from frost, but no artificial heat beyond this is required. The same conditions will suit *Cinerarias* and *Calceolarias*. *Primulas* and *Pelargoniums* should not fall below 45°. *Fuchsias* may be placed under the stage now and rested.

HEATH HOUSE need not exceed 40°. Avoid all damp beyond what is necessary. Look after mildew, and apply sulphur if it appears.

VINERY.—A night temperature of 50° need not be exceeded at present in the house just started. In the daytime, with sunshine, the thermometer may run up to 80° at closing time, which should be done about 3 o'clock, or earlier. It will be necessary to use a little fire-heat where ripe Grapes are hanging. But all ripe Grapes may be cut and bottled if there is a room that can be kept at an equable temperature to receive them.

PEACHES.—The early house should be brought on steadily at a night temperature of 45°. Damp the trees over with the syringe every bright day to induce activity in the buds. The trees in the late house may be pruned and trained now.

FIGS.—Prune, clean, and train all trees planted out in the borders preparatory to forcing in January. Plants in pots should be repotted or top-dressed.

CUCUMBERS.—Only a small crop of fruits should be permitted on plants in bearing now. Use the knife as little as possible during the dark dull days. All pruning now should be done with the finger and thumb.

APPENDIX

The Plum¹.—As an orchard fruit the Plum stands on the same level as the Apple and the Pear, and in certain districts in favourable seasons it is often more profitable than either. In the Vale of Evesham and other parts of Worcestershire and the neighbouring counties the Plum thrives and is profitable ; and in some parts of Cambridgeshire the orchards of Greengages are quite a spectacle in spring and summer. A limestone soil is the most suitable ; and the site of the orchard should be a sheltered one, for the blossoms of the Plum tree are fragile and easily destroyed by spring frosts. For a new plantation trench up the land 2 feet deep early in autumn, and plant standard trees 15 feet apart as soon as the land settles. Have the trees planted before Christmas if possible. Stake them, mulch over the roots with manure, and guard the stems from rabbits as soon as they are planted. The Plum as an orchard tree requires but little pruning. The long branches should be shortened back the spring following the planting to five or six buds, to induce shoots enough to break away to lay the foundation for a good evenly-balanced head ; and in after years the branches will require a little thinning to let in the air and sunshine, and perhaps in twenty years or so, if one need look so far ahead, sawing back some of the main branches to cause a new growth to break out will give a new impulse to the tree's life. This is especially true with respect to Damsons, the Orleans, and some of the small very fertile varieties.

PLUMS ON WALLS.—In well-ordered gardens it is a common practice to assign certain walls to particular fruits, and Plums in this arrangement are generally planted on those walls having an eastern or western aspect. And so far as regards the best dessert

¹ In collecting the articles forming this book, the above, through inadvertence, was overlooked, till too late for its appearance in its proper place.

varieties this arrangement is a good one; but where there is a large extent of north wall to plant, and if any doubt exists as to the best fruits to set, I should recommend Plums of such varieties as *Victoria*, *Goliath*, and *Magnum Bonum*, for they often bear well on a north aspect when the trees on other aspects fail. The cause of this is easily explained. In cold springs the sun, when it rises early in the morning and strikes the trees on the east wall with the frost still upon the flowers, completes the destruction the frost had begun. The trees on the north wall, thawing gradually, suffer less, and many of the blossoms escape destruction. The Fan system of training is the one usually adopted for the Plum and the Apricot, as it offers facilities for training up a new branch if required to fill vacancies. Cut the trees back the first year after planting, to obtain a good base to the tree. Afterwards only those shoots which are advancing too rapidly for the balance of the tree to be maintained need be shortened. Lay in as much young wood as there is room for, without crowding; and if healthy trees have been planted, and the site properly prepared, the wall will soon be furnished. On a wall 12 feet high plant the trees 15 feet apart. If the wall be higher or lower than 12 feet vary the distance accordingly.

The summer pruning will begin when the young shoots are an inch or so long by thinning the clusters, removing the weakly shoots, which cannot be of any use to the progress of the tree. In June pinch back the breast wood to four leaves, and put a tie or a nail and shred to those shoots it is intended to lay in for future bearing. This work will be repeated when necessary, and will in fact form the summer's attention to be given to the trees. If insects appear, wash with usual remedies, which have been referred to elsewhere. Thin the young fruits if too thickly placed, by removing the small ones. The chief part of the pruning will be done in summer in the way indicated above, but in winter the knife must be employed to give neatness and finish to the summer's work, by shortening back a long spur or cutting away dead wood, or thinning any part of the tree where the spurs are too thickly placed. The branches will, in some instances, require re-training to give them the right inclination; and in all cases the trees, when the leaves are down in winter, must be gone over carefully, and all ligatures removed which are too light, and not likely to afford sufficient support for the whole of the coming year.

PROPAGATION.—Plums are usually budded on seedling stocks of their own species. When the bark works freely in summer—generally early in August—select suitable buds from healthy fer-

tile trees of the kind it is wished to propagate, and place the buds low down on the stem of the stock, picking a smooth place on the shady side. Tie the buds in firmly, but loosen the ties as soon as the buds have taken. In the spring, when the sap begins to move, head the stocks back, making the cut in a slanting direction at the back of the bud.

VARIETIES--DESSERT.—Greengage, Transparent Gage, Golden Drop, Kirke's, Reine Claude de Bavy, Washington, Angelina Burdett, Blue Imperatrice, Goliath, Early Favourite, and Jefferson.

KITCHEN.—Belle de September, Early Prolific, Victoria, Orleans, Pond's Seedling, Prince of Wales, Magnum Bonum, Diamond, Crittenden Prolific, and Prune Damsons.

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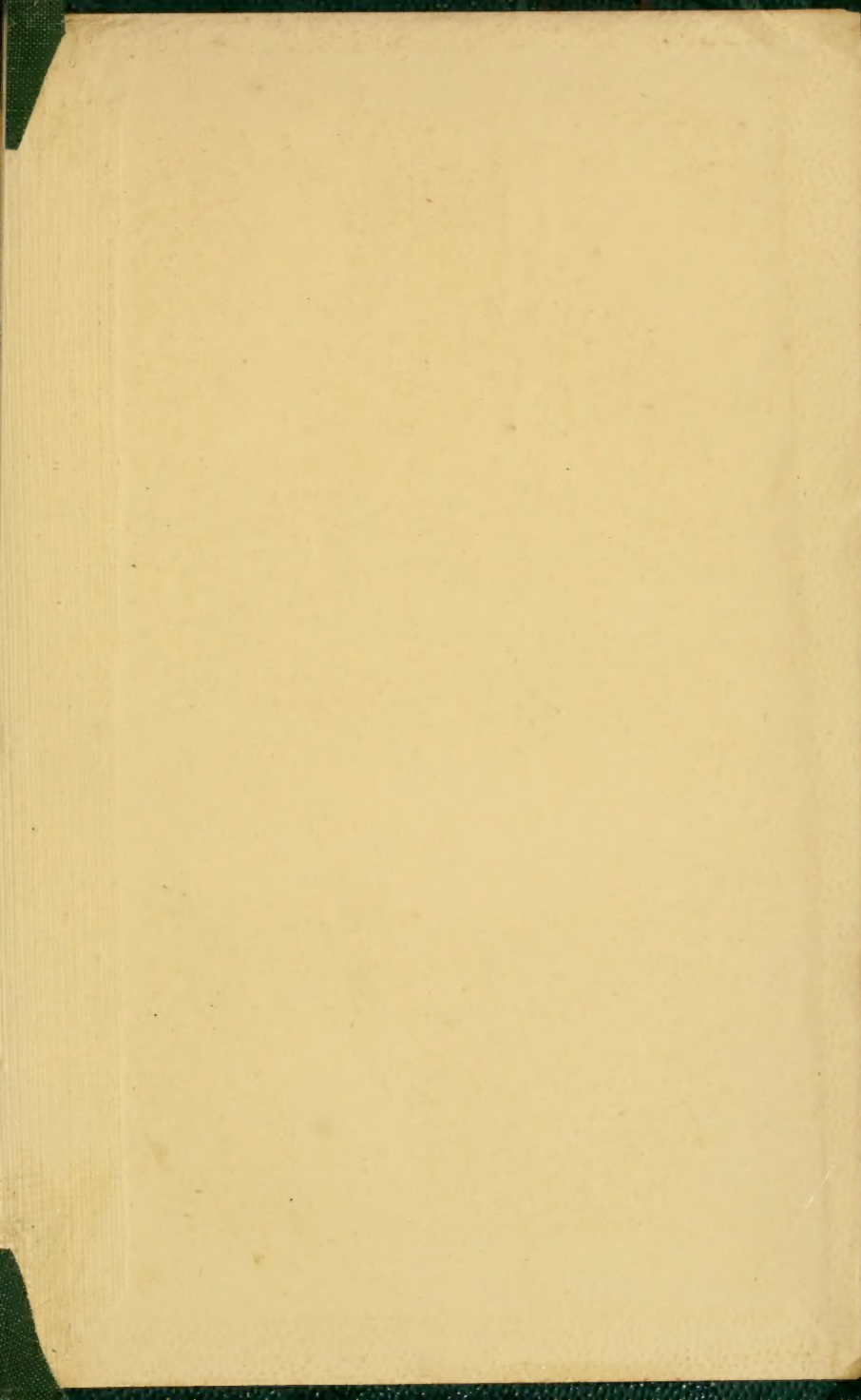
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